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Self-Adjustment, the Test

THE sharp break in the price of steel scrap, the feeling in some quarters that the steel operating rate may drop before the end of the year, the disappearance of gray markets and conversion deals, the cancellation of freight car orders, the cut in automobile prices, the end of a seller's market, and the reappearance of surplus capacity in almost every industry raise serious questions.

How far will the decline go?

Can the government compensate for such a decline by deliberate action?

Has business and financial leadership prepared itself for the change?

The answers to the first two questions must be found almost entirely in the field of opinion. There is no valid gage which in advance can measure the extent and the period of decline. Nor are there any satisfactory tools which can tell us how effective deliberate government intervention may be. That government outlay, farm price support, unemployment compensation, deposit insurance, and stock-piling—to mention only a partial list of compensatory devices—will cushion the fall is certain.

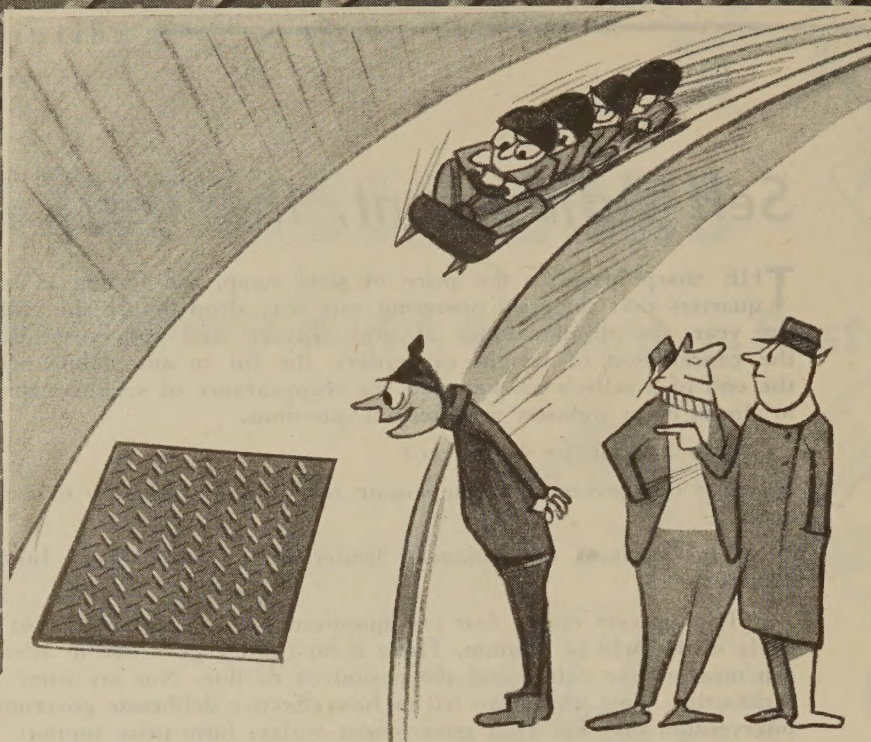
The third question dealing with the adjustment that our leaders may have made in their thinking and in their business dispositions permits a more definite answer. Never has the business community been warned more clearly of an impending business decline. There has been ample time "to assume a posture of defense." Inventories have been trimmed, bank loans reduced, credits scrutinized more carefully. The liquid assets of American business in the aggregate are near their all-time peak.

However, it is in the stock market that we see the clearest evidence of adjustment. The failure of the market in recent weeks to respond to the "ill winds" from the business world should not cause any surprise. The market has already taken into account a very substantial decline in business and earnings, and adjusted its values accordingly.

The most widely-accepted yardstick for measuring the level of the stock market is the Dow-Jones Industrial Average, representing the market level of 30 industrial stocks, including such leaders as U. S. Steel, General Motors, duPont, Sears Roebuck and Kennecott Copper. The combined earnings of one share of each of these 30 companies for 1948 was \$22. This is approximately 10 pct more than the aggregate of a similar group in 1929. The dividends received by the owners of these shares are only slightly less than they were in 1929. The market value of the 30 D-J stocks today is 54 pct less than it was at the peak of the boom in the 20's.

More significant still is a comparison with the period 1935-39. The D-J stocks in that period sold at prices which averaged 17.2 times earnings. Those same stocks are selling today at 8.0 times latest reported earnings. These earnings could drop 53 pct before the D-J stocks, assuming maintenance of present prices, would be selling at the price-earnings ratios which prevailed during 1935-39. That represents a substantial "adjustment to the probable."

Joseph Stagg Lawrence



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April 12, 1949

► This week there was no danger of a wide open break in regular steel mill prices. The cuts so far have been made by companies which had premium prices because of higher costs. Now they are competitive.

Pressure will be on steel firms for lower prices—it always has been in a downward swing. But until demand is so slow that operations are hard hit there will be no major testing of regular mill prices. Any attempt by one firm to gobble up business with a lower price will be met almost immediately by other companies. The advantage, if any, would be shortlived.

► European steel companies are actively interested in pressure top operation of blast furnaces. Two companies in France and one in Holland are planning to convert blast furnaces to top pressure. Output is expected to increase by 15 to 20 pct with simultaneous coke economy.

► Core inserts of fusible alloys are being used by several foundries to produce intricate cores where involute curves or other design factors make removal of inserts difficult. The low melting point inserts are melted during core baking and are easily run out. Better than 90 pct of the fusible alloy is recovered for re-use.

► Top Administration leaders won't admit it publicly, but it is an open secret in Washington that word has come down from the White House to lay off the steel capacity issue. Decision is apparently based on rapidly increasing steel supply, which could no longer be ignored.

► The major currencies of the world will undergo rather sharp devaluation and realignment vis a vis the dollar before the end of the year. The dollar also will likely undergo some devaluation in terms of gold—that is the buying price of gold will be lifted, which is basically an inflationary action.

Ever since the end of the war the exchange rates between various countries have been held at artificially stable levels in order to accelerate postwar recovery. Now that most countries are seeking export outlets more realistic adjustments of exchange rates will become a problem of paramount importance.

► Look for an announcement soon of an improved method of steelmaking. While still essentially in the development stage, the process appears to hold considerable promise as a means for the rapid production of openhearth quality steel low in phosphorus and nitrogen.

► The breakeven point for steel ingot operations is still generally unknown. One large producer that has been using an arbitrary figure of 75 pct of rated capacity is now making a study to arrive at a more exact percentage. This estimate will only hold for a few months and will have to be revised when coal and steel labor costs are settled.

► China will continue to ship tungsten concentrates to the United States as long as the Communists do not control the southern China producing areas. Brazilian production of tungsten ores has been expanding. Annual production is now at the rate of 1000 tons of high grade concentrates, but it is estimated that adequate capital investment could multiply Brazilian output by 10 times.

► An automatic unit for drawing, straightening, cutting to length and polishing brass rods, in operation for 4 months, is working out very successfully—giving rates up to 150 fpm, double that of conventional drawbenches and triple that of other types of continuous drawbenches.

► The squeeze is being put on its suppliers by the automobile industry to get quotations down. Some suppliers have resisted the pressure; others, fearing the loss of business to competition, have shaded their quotations. This, plus cheaper steel, points to still more price cuts on autos.

► There have been rumblings that steel firms would soon have to absorb freight if they hope to remain competitive. Latest opinion is that widespread freight absorption by major steel firms will not be made until the law is crystal clear that such action is legal. This means that a decision from the Supreme Court must clarify the matter first. Stop gap moratorium legislation is not the answer, according to some steel people.

► Fatigue strength improvement on shot peening has been found to be very substantially increased if the part is statically stressed in the same direction as the stress to be sustained in service during the shot peening operation.

BRASS

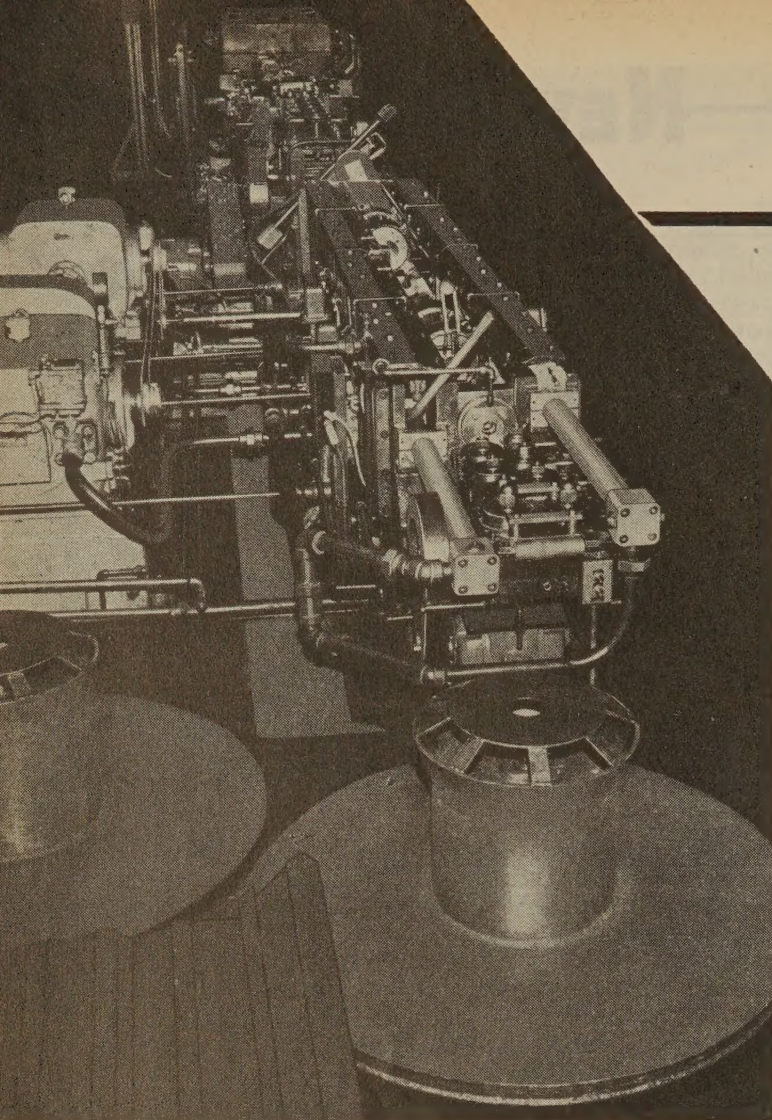


FIG. 2—View from the feed end, showing in the foreground the uncoilers. At right, above the uncoiler drum, is the prestraightener, followed by the draw die and the two drawbench carriages (arrow). An arm of the trimming saw is visible at the far end of the drawbench. Hydraulic pumps for the drawbench are at left center.

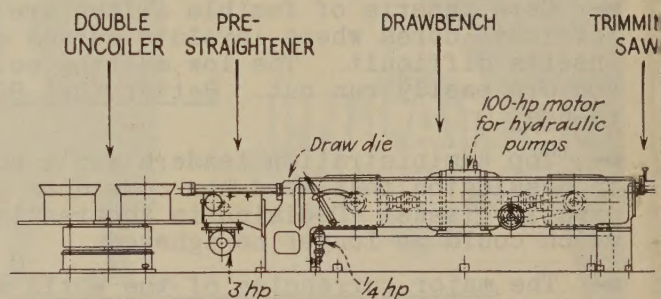


FIG. 1—Schematic view of the Loma continuous drawing, straightening, and trimming machine.

By U. M. EVANS

Works Manager,
Anaconda American Brass, Ltd.,
New Toronto, Ont.

COLD drawing of brass screw machine stock at the rate of 150 fpm is being accomplished at the plant of Anaconda American Brass, Ltd., New Toronto, Ont., in a continuous automatic operation which combines drawing, straightening, cutting to length and polishing in a single continuous operation.

This unit has been in operation for approximately 4 months and has proved eminently successful in handling round stock from $\frac{3}{8}$ to 1 in. finished size and $\frac{3}{8}$ to $\frac{7}{8}$ in. hexagon and square stock. Eleven different sizes are being currently drawn, mostly in standard free turning screw machine stock, with reductions averaging 15 pct. The speed of this machine is about double that of conventional drawbenches and triple that of other continuous drawbenches. A sketch of this layout is given in fig. 1.

The design of this automatic unit is based in

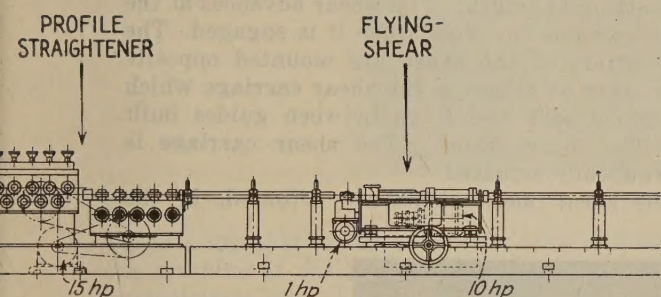
part on types used in Europe for some time, but has been considerably modified to produce a higher production rate and to minimize down time.

The machine, built by Loma Machine Mfg. Co., New York, consists, basically, of a series of units interlocked mechanically and electrically into one machine, which, when fed with continuous lengths of bar stock automatically and continuously performs the following operations: preliminary straightening, drawing, straightening, cutting to length and polishing.

Stock for drawing, in coils, is loaded on the uncoiler shown in the foreground of fig. 2 and is swung into position opposite the feed end of the machine. This uncoiler is of the swivel type with two drums mounted on opposing ends of a pivoting arm. This permits one coil to be feeding, while a second coil is being loaded on the

RODS

Drawn, straightened, cut to length and polished in a continuous operation



ing, polishing and cutoff machine for handling brass rod from coil stock.

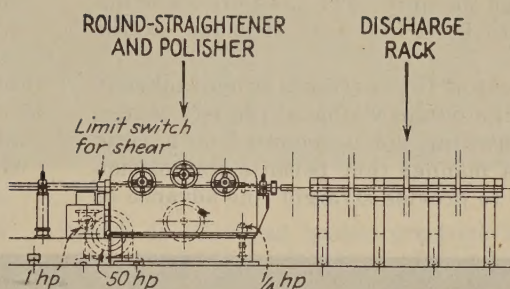
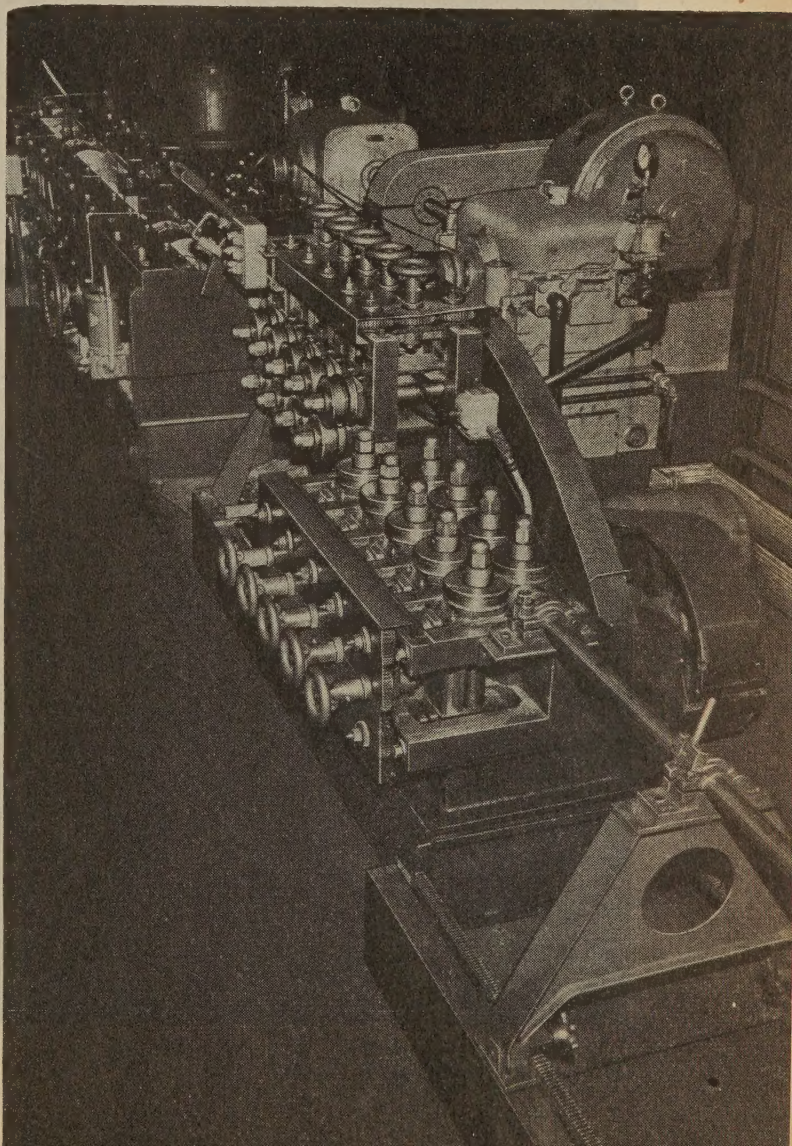


FIG. 3—View from the exit end of the drawbench showing the continuous straightener. The rack on the A-frame at lower right permits quick and easy adjustment of the guides and of the cutoff length.



Drawing, straightening, cutting to length and polishing of brass rods in one continuous automatic operation, at rates up to 150 fpm, is described by the author. Capable of handling rounds in sizes from $\frac{3}{8}$ to 1 in. and square and hexagon stock in sizes from $\frac{3}{8}$ to $\frac{7}{8}$ in., this unit produces finished stock at a rate approximately double that of conventional drawbenches and triple that of other types of continuous drawbenches.

empty drum. Automatic stops, controlled by a foot pedal, position and release the coiler. Present operations at Toronto are based largely on long rods and short coils, but following certain rearrangement of auxiliary equipment, it is planned to work entirely from heavy and long extruded coils to obtain the maximum efficiency from the machine. At present only the smaller sizes of hexagon, from $\frac{1}{2}$ in. and smaller, are being drawn due to the lack of suitable winding equipment on the extrusion press.

From the uncoiler, the stock passes into the preliminary straightener, shown in fig. 2, where kinks and bends are removed by six straightening rollers. The stock is fed into this straightener by a pair of motor-driven feed rolls of large diameter which are maintained in preset pressure against the stock by hydraulic pressure.

This drive arrangement forces the pointed end

of the stock, as it leaves the straightener, into the jaws of the drawbench. The feed rolls then retract and the drawbench provides the necessary movement.

The drawbench (see fig. 2) is constructed with two reciprocating carriages, both equipped with jaws. The motion of these carriages is so overlapped that when one is closed on the stock and pulling it through the draw die, the other is returning to a forward position. This second carriage then clamps onto the stock and begins to advance synchronously with the second unit. For a brief interval both units are moving in the same direction, both clamped to the stock. The first carriage then releases the stock and returns at high speed to the head of the machine, while the second head is still advancing with the stock. This overlapping assures continuous movement of the rod through the unit. The jaws are made unusually long to keep the unit pressure on the stock low.

The movement of the carriages is hydraulically controlled by the pumps visible at the left center, fig. 2. The drawing die is mounted on a rigid die stand in a manner that permits its position to be adjusted to provide straight line advance of

the material through the drawbench. A coolant is delivered to the carbide die by a separate pump.

The front carriage of the drawbench is equipped with auxiliary jaws which grip the pointed end of each new coil to start it through the die and into the second carriage. Just beyond the drawbench an abrasive saw is located which cuts off the pointed end.

After passing this saw station, the stock enters a profile straightener, fig. 3, which consists of two sets of straightening rolls, one set turning in a horizontal position, the other vertically. Each set consists of 9 rollers, 4 of which are driven. The remaining 5 are idlers which can be adjusted individually.

Leaving the straightener, the stock passes, via a tubular guide, to a flying shear shown in fig. 4 for cutting to length. This shear advances at the same speed as the stock when it is engaged. The two cutters of the shear are mounted opposite each other on slides on the shear carriage which can move back and forth between guides built into the shear frame. The shear carriage is hydraulically actuated.

The shear mechanisms are actuated, in the

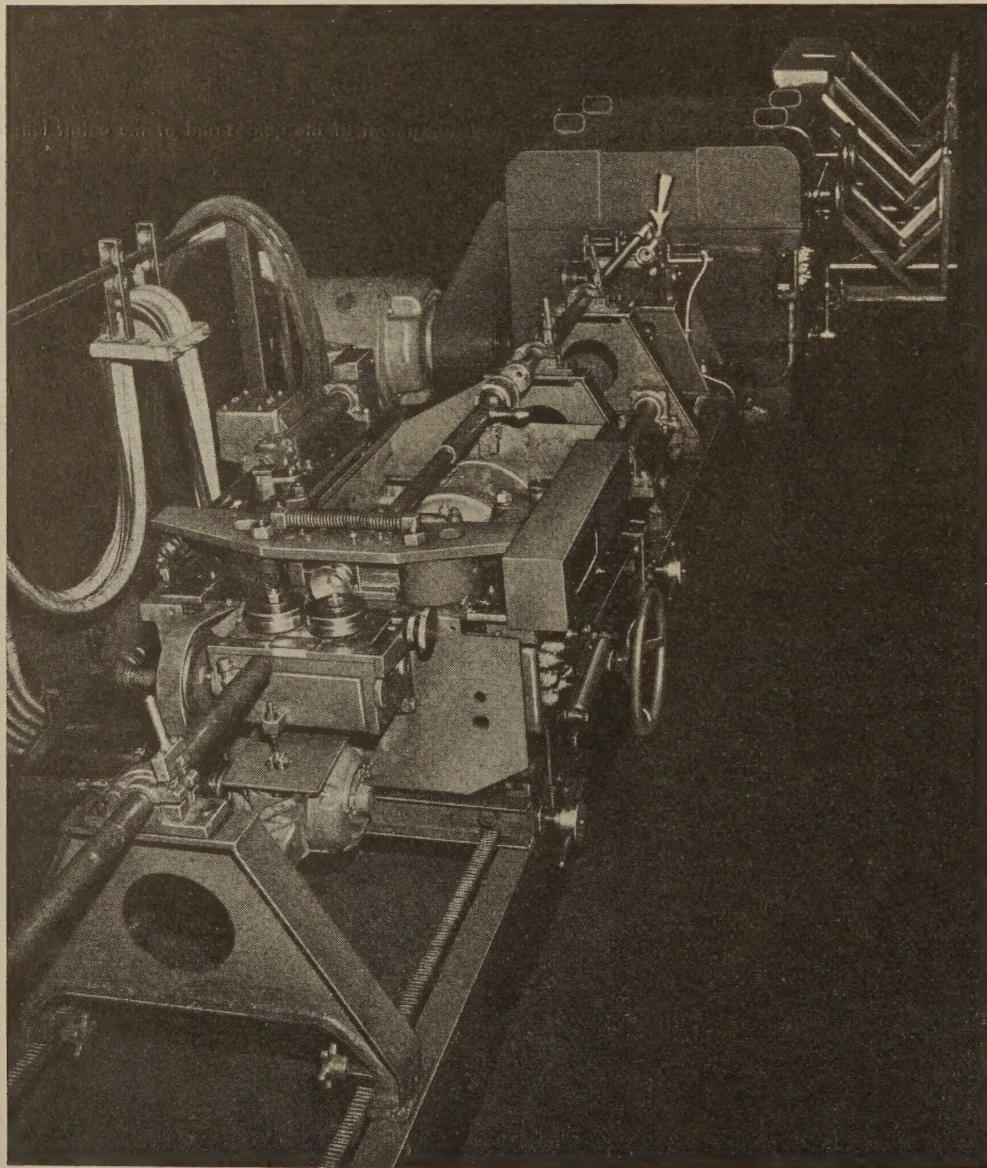
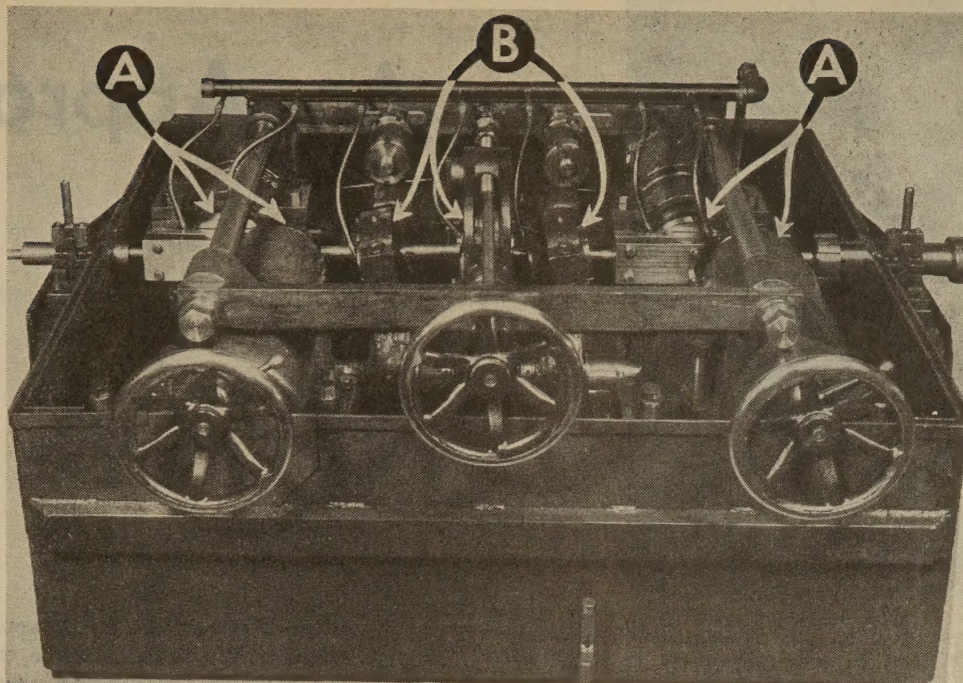


FIG. 4 — The entrance end of the flying shear is shown here. Arrow indicates electric trip which actuates shears. The enclosed machine beyond the switch (arrow) is the round straightener and polisher.

FIG. 5 — View of the straightener and polisher with hood removed showing at A, the four polishing disks and, at B, the three straightening bushings.



Toronto installation, by an electric trip, although the machine is designed to also operate with a photoelectric cell. The polishing unit, which follows the shearing operation, draws the cut stock through at a speed slightly in excess of the speed of the rod through the preceding operations, hence a gap always exists between the end of one sheared rod and the leading end of the following. This gap is used to actuate either the trip or the photoelectric cell. The cutoff length is determined by the distance between the trip switch and the shear at its rest position. This distance can be easily varied by shifting the shear along its frame.

After cutting to length, the stock is advanced into a straightening and polishing machine, visible in the rear, fig. 4, and in fig. 5. While traversing the polishing unit, the stock passes between two sets of motor driven disks located at the exit and entrance of the machine. The two disks of each set are mounted off center opposite each other and rotate in the same direction. The

stock is conveyed under pressure between the disks and by special shape of the hardened surface of the disks, the rod passes at a level slightly above center line of the rotating disks. This results in a combined rotating and advancing movement of the stock. The high pressure to which the stock is exposed when passing between the disks produces a condensed polished surface on the stock.

The straightening effect is obtained by bushings, shown in fig. 5, located between the two sets of disks. These bushings are adjustable out of center and cause the spinning stock to bend in all directions, thus relieving stress from the preceding drawing operation.

The finished product is delivered to a discharge table mounted behind the polishing machine. Experience to date has indicated that brass rods drawn in this unit are generally a little more highly polished than comparable material drawn and straightened by conventional methods.

... NEW BOOKS ...

"Stahl-Handbuch," by Walther Hiller. Encyclopedia of iron and steel engineering reviews metallurgical principles, the alloys of steel, steel for special purposes, the manufacture of steel, heat treatment, physical properties, etc. The text is primarily intended for tool engineers, machine designers and others having a similar interest in the subject. In German. R. Bohmann, Industrie und Fachverlag, Doblhoffgasse 5, Vienna I, Austria. \$3.80. 326 p.

"High-Speed Photography." Booklet on high-speed photography contains papers presented at a symposium held during the October, 1948, convention of the Soc. of Motion Picture En-

gineers. Descriptions of various high-speed cameras and of techniques used by governmental and industrial agencies are given. Still photography as well as motion picture technique is covered. Soc. of Motion Picture Engineers, 342 Madison Ave., New York 17. \$1.50. 129 p.

"Manual of Photomicrography." Prepared by Carl Zeiss Co. of Germany, this manual discusses instruments of photomicrography, the theory underlying use of such instruments, and gives special attention to light sources and their use in both light-field and dark-field illumination. Library of Congress, Photoduplication Service, Publication Board Project, Washington 25. Order by number PB 92781. Photostat, \$17.50; microfilm, \$5.50. 133 p.

An Approach to

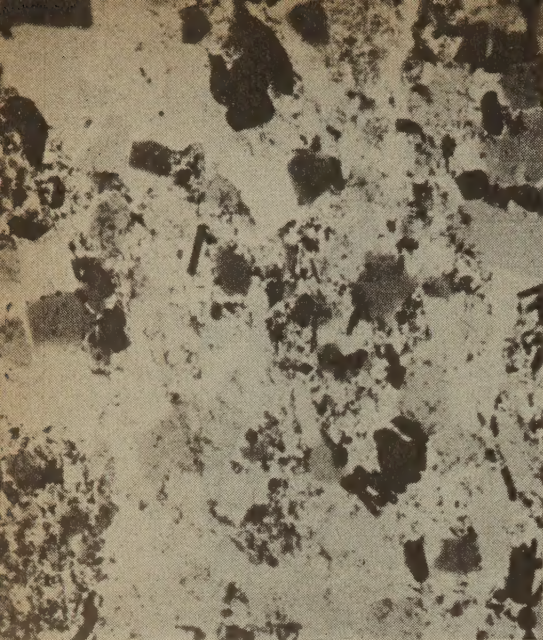


FIG. 1—Photomicrograph of a thin section of taconite showing intimate distribution of iron oxide (white areas) in quartz (white and gray areas). 96X.

WITH the approaching exhaustion of the high grade Lake Superior iron ore deposits, which have provided about 85 pct of the total requirements of the steel industry for 50 years, new attention is being focused on utilization of the larger tonnages of low grade ore still remaining in the Superior district.

The geology of the Lake Superior iron ore district has been extensively studied and the remaining reserves can be estimated rather closely. Estimating the remaining Lake Superior reserves of shipping ore at 1600 million tons (this is 500 million tons greater than the official tax commission estimates) and dividing by a conservative annual shipment figure of 65 million tons (the 1940 through 1945 average is 92.9 million tons) a figure of, roughly, 25¹ years. Should the rate of shipments increase gradually, as seems probable, 20 years may be a more accurate figure. The pinch could come sooner than that, probably in less than 15 years, because one-third of the reserve is underground ore mined at a much lower rate than the easily accessible open pit ores.

There are many tens of billions of tons of low grade potential iron ore in the Lake Superior region. The high grade Lake Superior ore bodies are relatively small localized spots within much larger areas of the "iron formations" which are composed of iron-bearing rocks called taconite.

Taconite constitutes the tremendous potential

¹ A prediction that the high grade ore will be exhausted in 12 years was made by J. W. Gruner in "Iron Ore," THE IRON AGE, Jan. 6, 1949, p. 228.

reserve; but taconite contains only 25 to 30 pct Fe and about 50 pct SiO₂, so it is altogether unusable in its present form as blast furnace feed.

Blast furnace ore should contain not more than 8.5 pct SiO₂, and to make taconite available as an iron ore for present practice, silica content must be lowered, iron minerals must be concentrated, and the concentrates put into suitable physical condition before they can be used to make iron.

There are varieties of taconite², but in general, the ore can be considered as a dense, hard, rock composed essentially of quartz (SiO₂ — usually the variety chert), and oxides, silicates and carbonates of iron.

Technologically, an important classification of taconites divides them into magnetic and non-magnetic varieties. In magnetic taconite much of the iron present is in the form of magnetite (Fe₃O₄), the magnetic iron oxide. In nonmagnetic taconites the iron occurs mostly as hematite or limonite, the nonmagnetic oxides, and to a lesser extent as iron silicates and carbonates,

² E. W. Davis, "Iron Ore Reserves of the Lake Superior District," *Mining and Metallurgy*, vol. 28, No. 481, p. 15, January 1947.

which in their natural state are also nonmagnetic. The magnetic taconites can be ground and the iron mineral separated magnetically from the silica, but to effect a comparable separation in the nonmagnetic variety, the ore would have to be roasted to convert the iron minerals to magnetite, or some other method of separation must be used.

In either case, since the iron minerals are finely disseminated and locked in the quartz, the rock must be crushed and ground extremely fine to prepare it for a concentration process. Fig. 1 is a photomicrograph illustrating the finely disseminated nature of the iron ore minerals. Practically all the methods now being used or proposed for the solution of the taconite problem are along the lines of conventional ore dressing. Magnetic taconite is naturally favored because of the possibility of magnetic separation, but since magnetic taconite does not constitute nearly as large a reserve as nonmagnetic taconite, a proc-

Taconite Utilization

By JOHN J. HOWARD

Philadelphia

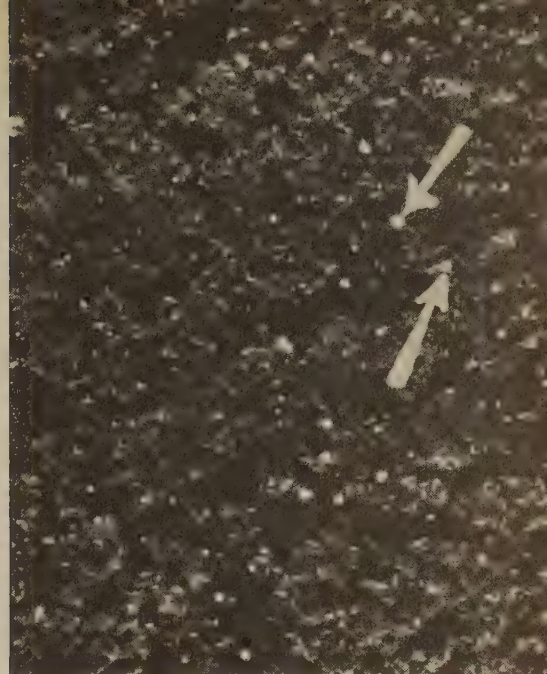


FIG. 2—Photograph of surface of a briquette that was made of a mixture of ground taconite and coke mixed together, pressed, and fired for 1 hr at 2500°F. The spherical globules (white arrows), have the composition of pig iron and are loosely held in a friable matrix of silica. 8X.

ess to recover the iron mineral from that variety must eventually be developed.

The conventional approach begins with crushing and fine grinding the ore (to -150 or -200 mesh) to unlock the iron ore minerals from the siliceous gangue. Then come various physical separation procedures (or combinations of them) among which are mechanical, gravity, flotation, and magnetic methods. Magnetic separation seems at this time to be receiving the most attention. The magnetic concentrate is then agglomerated by some type of sintering, nodulizing, or briquetting before it can be fed to the blast furnace. Only as a final agglomerated concentrate can the material derived from taconite be considered comparable with present crude high grade ore.

The plants treating taconite (if eventually it becomes the major source of iron) will be of tremendous capacity, for $2\frac{1}{2}$ to 3 tons of taconite are needed to produce 1 ton of usable furnace ore. The present high grade ore is simply quarried from the earth and shipped to the furnace. But if $2\frac{1}{2}$ to 3 times as much taconite must be mined and a new, tremendous manufacturing plant interposed to get the same result, it is safe to assume that the economics of steel may be profoundly affected.

Experimental work carried out by the author points to a different method than previously described for winning iron from taconite. The premise upon which this proposal is based is as follows:

The most satisfactory physical condition for chemical reaction is the gaseous phase, because the reagents are miscible in all proportions and molecular contact is possible to the greatest extent. To approach gaseous phase conditions in reactions between solid reagents, the reagents are comminuted as far as economically possible, thoroughly mixed and pressed together. The maximum surface exposure is then obtained for reaction, the surfaces of the reacting solids are as close to each other as possible, and when the proper conditions are obtained the reaction can take place with the maximum velocity. By comminuting, mixing and pressing the solid reagents,

the best physical condition for chemical reaction is approached, but never reached.

Instead of following customary procedure of removing the gangue from the ore to produce a high grade product, which, after expensive treatment, is still an iron ore that must be reduced in the blast furnace, this new proposal reduces the iron oxide to metal directly from the taconite, and the metal is recovered by well-known methods of separation.

This process, stated in its bare essentials, is as follows: (1) Grind the taconite to only moderate size (-40 to -60 mesh); (2) mix with it the required amount of ground coke or coal for complete reduction; (3) press the material into a brick or briquette; and (4) heat.

The resulting product will be a rather friable lump consisting of altered quartz and spherical globules of metallic iron which can be magnetically separated, see fig. 2. The bricks or briquettes can be heated in either rotary or tunnel kilns. Although the temperature required for reduction is not critical, it has been found that 2500°F is sufficient, with the time period at that temperature for complete reduction of only a few hours. Repeated heats in large crucibles in a stationary furnace have shown complete reduction of the iron in about 1 hr.

The iron is reduced from the oxide and collects in globules, but since the silica does not melt below 2900°F, the process is essentially a completely dry solid state reaction. There are certain methods by which the iron composition of the product can be changed, and also for increasing the globule size, such as "sweetening" with a high iron content material which has only silica as gangue.

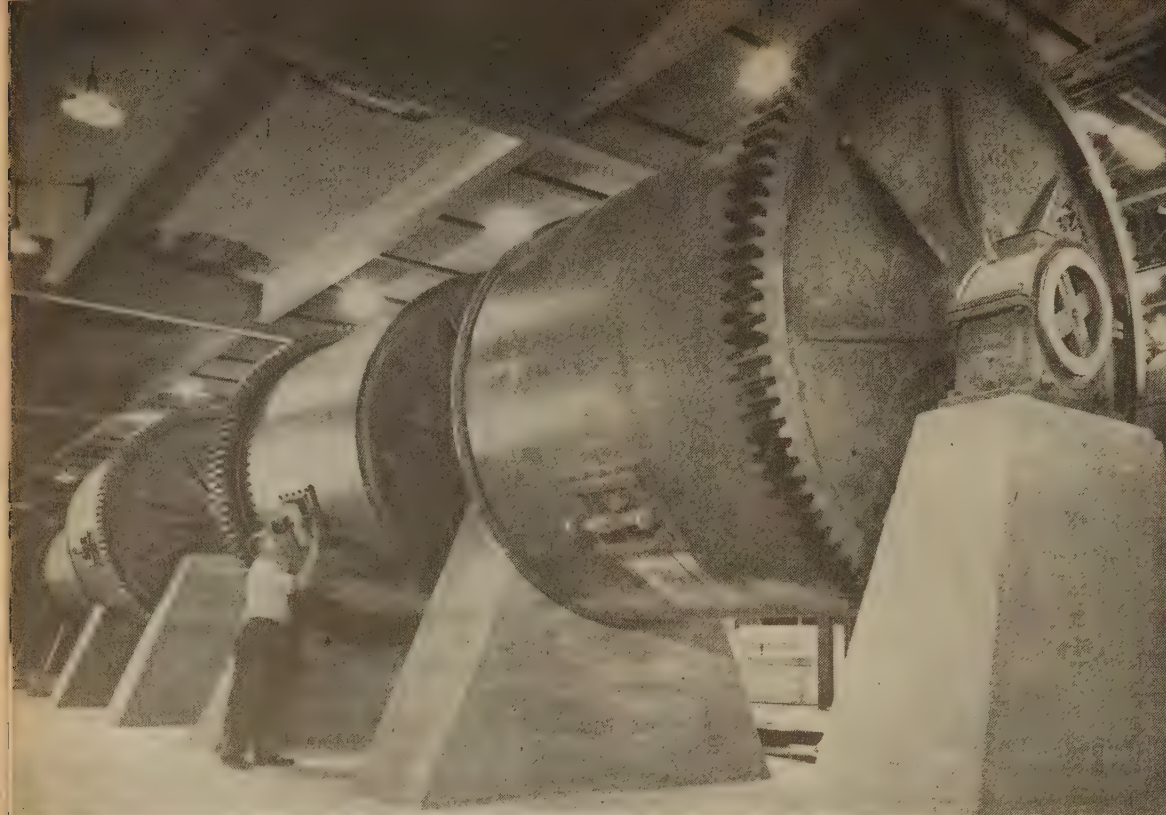


FIG. 1 — View of ball milling room where the enamels are prepared. In all, 23 mills are used, having a total daily capacity of approximately 30,000 gal of liquid enamel.

Porcelain Enameling

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COMPONENT parts of the Lustron all-steel house, the inside and outside paneling, are finished by a porcelain enameling process of recent development which incorporates a number of departures from standard enameling practice. These departures are, in general terms: (1) The use of low carbon cold-rolled steel rather than premium quality enameling iron; (2) the use of enamels maturing at 1300°F rather than the conventional 1500°F, and (3) for interior house sections, single coat applications of enamel with elimination of the ground coat and the need for two firings.

Starting with the raw material in following the process through, the ability to fire at 1300°F, rather than 1500°F or higher, circumvents the necessity for using enameling iron. Dimensional stability at the firing temperature has been the essential reason for using enameling grades and the extra mill processing required to impart this stability accounts for the premium price. At 1300°F, however, auto body stock is comparable in di-

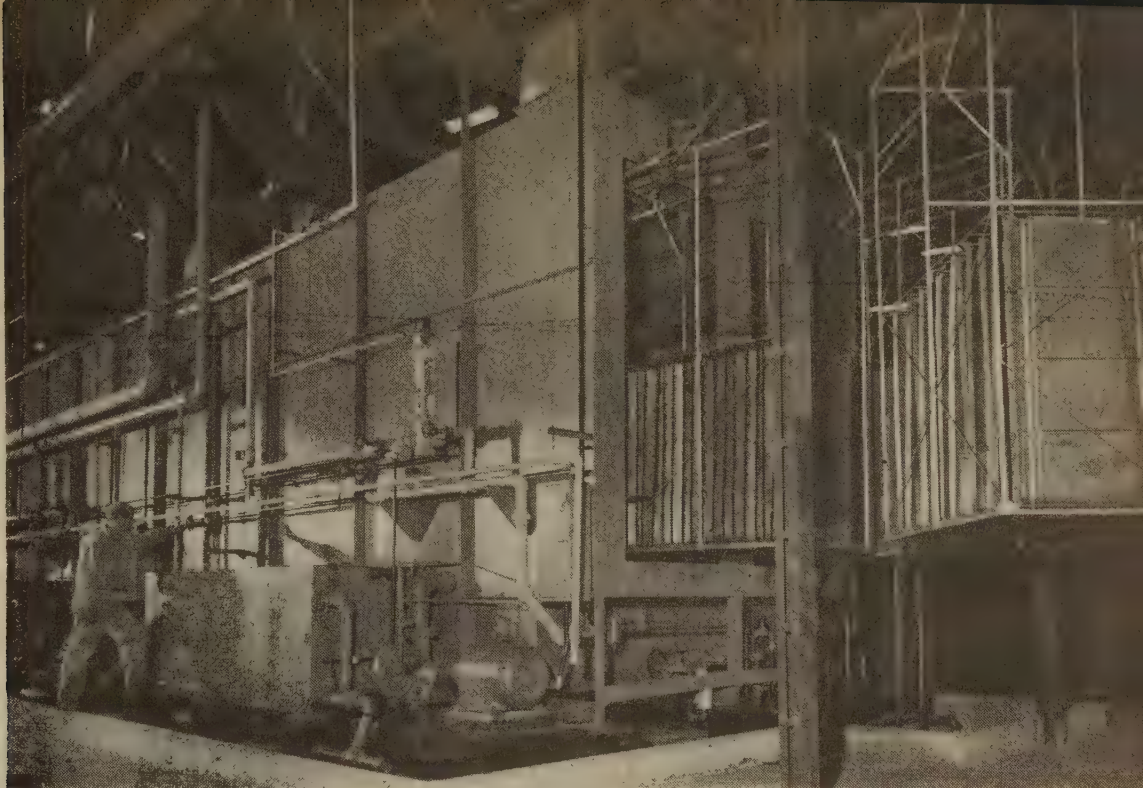
mensional stability with enameling iron and, at Lustron, the panels have not been found to require any special bracing and firing tools as are commonly used in the conventional firing of pieces of complicated shape and unusual length.

Sheets are purchased in the oiled state to facilitate fabrication, minimize rusting and reduce surface marring. The use of oiled rather than dry sheets is in itself a radical departure from standard enameling plant practice where the necessity of securing a clean metal surface prior to enamel application is mandatory and where cleaning by strong alkaline solutions alone will not remove the unsaponifiable oils applied at the mill.

Lustron's operations were set up on the premise that this type of operation was feasible. Experience thus far has shown no impairment of quality. Actually, there are indications that the operations have improved present quality standards, but a definite statement to this effect must await further tests.

All the enamels used are essentially complex

FIG. 2 — Stamped house sections entering one of the double-tunnel cleaning and pickling machines used in surface preparation.



At Lustron . . .

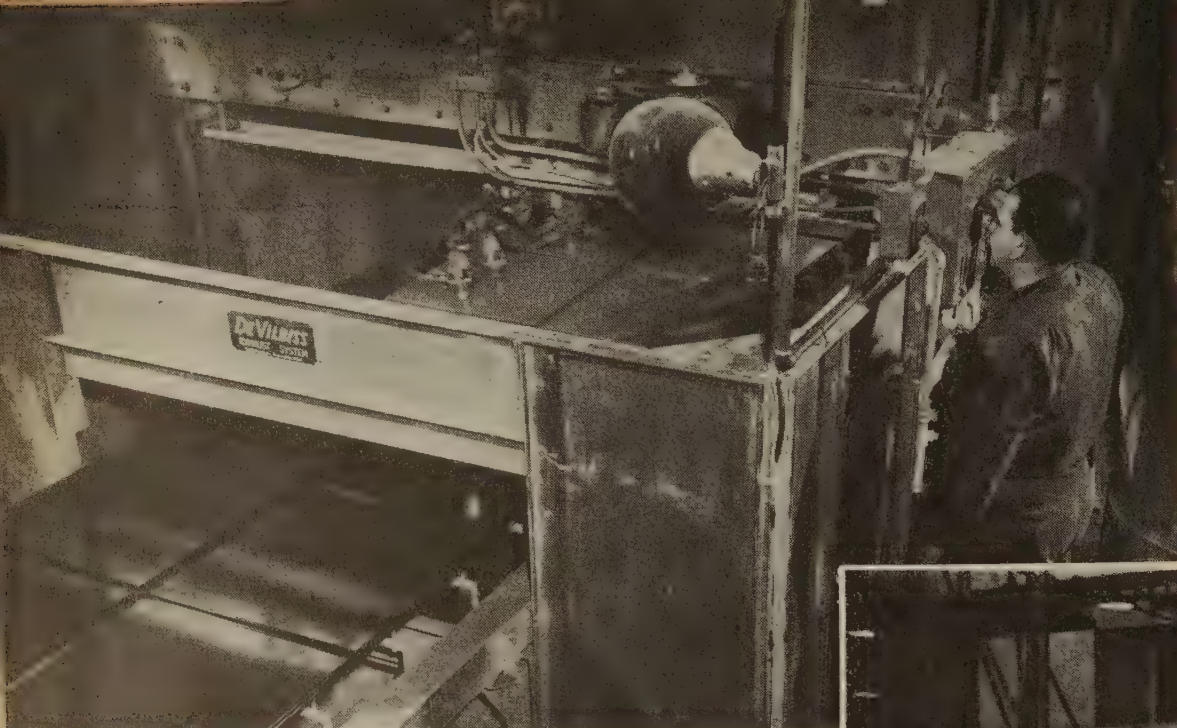
One-fire enamel finishes, firing temperatures of 1300°F, and other departures from conventional practice which have been incorporated in the world's largest porcelain enameling installation are described by the author. Because of the low firing temperature, enameling of regular auto body stock rather than premium quality enameling iron has proved practical, and automatic equipment has been utilized wherever possible to facilitate the enameling of 760,000 sq ft of surface per day.

alkaline-boro-silicate glasses with the same addition materials as are utilized in the conventional enamels that mature at 1500°F. Proportions are somewhat different, however, and procedures used in manufacturing the frit have been adjusted to allow for these changes in proportion.

To produce any one color combination house, it requires 11 different enamels, subdivided as follows: (1) Basecoat; (2) covercoat for roofs; (3) covercoat for exterior walls; (4) covercoat for gable ends; (5) covercoat for exterior trim; (6) interior ceilings; (7) interior walls in kitchen and bath; (8) interior walls in remainder of house; (9) sanitary ware groundcoat; (10) sanitary ware undercoat; and (11) sanitary ware covercoat.

For preparation of these enamels a sizable ball milling installation, fig. 1, consisting of mills manufactured by the Patterson Foundry & Machine Co. and International Engineering, Inc., has been put in. Table 1 gives a breakdown of the dimensions and capacities of the 23 mills in use.

The formed steel sections to be enameled come from the presses on an overhead monorail conveyer and are carried directly into either of the two double-tunnel cleaning and pickling machines, fig. 2, used for metal preparation. These machines, of the spray type, were made by Metalwash Machinery Corp. and have an overall capacity of 1 ton of steel per min. Actually the capacity realized, due to piece part



ABOVE

FIG. 4—All coatings except the groundcoat for exterior surfaces are applied by spraying. Parts are carried into the booths on laydown conveyers.

RIGHT

FIG. 3—Exterior house panels being dipped for application of the groundcoat. After dipping, conveyor carries the sections through a drying oven. Entrance to the oven can be seen at the rear left.



geometry, is approximately 1100 lb. Steps in the preparation cycle are given in table II.

The only step in this cycle substantially different from conventional cleaning and preparing practice is the nickel flash. Generally a deposition of about 0.03 g per sq ft is applied. However, for the 1300°F firing enamels it is essential that 0.06 to 0.10 g per sq ft be applied to insure proper adherence of the enamel. This nickel flash governs the oxidation properties of the metal during enamel fusing and provides the proper balance for solution bond in the adherence mechanism.

All solutions for the spray pickle machine are heated by automatically-controlled steam coils. A pH recording device is used for continuous control of the important nickel sulfate solution.

TABLE I

Breakdown of Ball Mills Used in Preparing the Enamels

No. of Mills	Size of Each Mill	Frit Charge per Mill	Total Frit Charge	Enamel Produced per Mill	Total Enamel Produced*
8	8x8 ft	7,500 lb	60,000 lb	750 gal	6,000 gal
5	6x8 ft	4,000	20,000	400	2,000
7	6x6 ft	3,000	21,000	300	2,100
1	5x6 ft	2,000	2,000	200	200
1	42x48 in.	500	500	50	50
1	36x48 in.	400	400	40	40
23			103,900		10,390*

* Milling time is approximately 5½ hr, regardless of mill size, so that overall capacity of the milling room is about 30,000 gal of liquid enamel on a 3-shift basis.

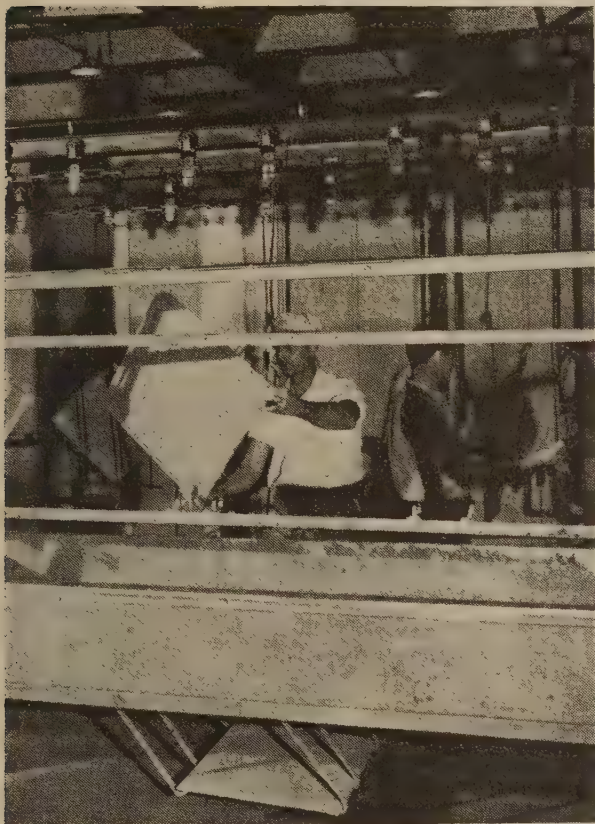
From the pickle machine the sections move to the enameling stations. The base coat for exterior panels is dipped, as shown in Fig. 3, while all other coatings are applied by spraying.

The majority of pieces sprayed are adaptable to automatic machines of the reciprocating arm variety. The parts are carried into the spray booth, as in fig. 4, on flat, laydown, pin-type conveyers which pass under four guns mounted on a carriage that traverses the span of the conveyor in a motion transverse to the direction of the moving parts. The booths and auxiliaries are equipped with DeVilbiss Co., Binks Mfg. Co., Despatch Oven Co. and American Wheelabrator & Equipment Corp. units.

The pieces then move into direct gas-fired ovens, made by the Despatch Oven Co., for drying. The entrance to one of these ovens can be seen in fig. 3. From the ovens the pieces continue to the firing furnaces. There are nine of these furnaces for the architectural panel lines. Six are gas-fired muffle type furnaces with a

19,000 lb per hr capacity and were manufactured by A. J. Boland Co. One furnace is a gas-fired muffle type, also made by A. J. Boland Co., but with only a 12,000 lb per hr capacity. Two are electric furnaces with 29,000 lb per hr capacities, made by the Lindberg Engineering Co., and shown in fig. 5. In addition, there are two gas-fired units for sanitary ware. These have 15,000 lb per hr capacities and are A. J. Boland Co. units.

In each furnace, there are three main divisions or zones: (1) Preheat; (2) firing, where 1300°F is maintained, and (3) cooling. The nine architectural furnaces have a combined



RIGHT
FIG. 5 — Panels emerging from one of the two electric firing furnaces used. These units each have a 29,000 lb per hr capacity.

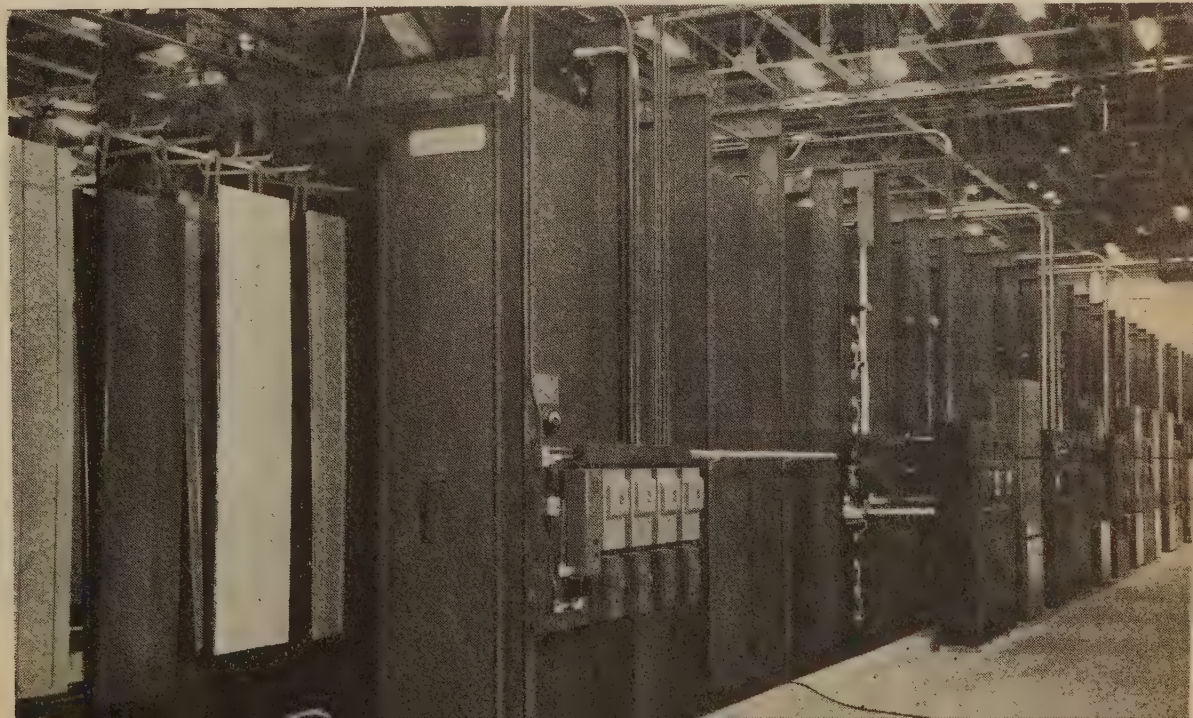


TABLE II

Metal Preparation Cycle Carried Out in Automatic Spray Machines Prior to Enameling

Operation	Temperature of Solution	Time of Exposure to Solution
(1) Emulsion Cleaning: Emlon, 1 part per 100.....	180°F	1 min
(2) Water Rinse.....	Cold	40 sec
(3) Alkaline Cleaning: Wyandotte No. 38, 1 oz per gal.....	180°	1 min
(4) Water Rinse.....	Cold	1 min
(5) H ₂ SO ₄ Pickle (7 pct).....	160°	3 min 15 sec
(6) Water Rinse.....	Cold	1 min
(7) Nickel Flash: NiSO ₄ , 2 oz per gal, pH 3.0.....	185°	4 min 40 sec
(8) NaCN Neutralizing: NaOH + NaCN to concentration of 0.1 pct Na ₂ O.....	130°	1 min
(9) Alkaline Neutralizing: NaOH + borax to concentration of 0.12 pct Na ₂ O.....	180°	1 min
Total Time in Contact with Solutions.....		14 min 35 sec
Transfer Time Between Solutions.....		12 min 25 sec
Total Time in Machine.....		27 min

capacity of 184,000 lb of ware and tools per hr. The furnace conveyers move at a speed to provide approximately 4½ min in the firing zone. Some of the heavier parts, of 14 and 16 gage metal, are fired independently at a slower conveyor speed to assure sufficient firing time for the metal to reach temperature. But the majority (over 90 pct) of the parts are fabricated from 20 gage sheet and a 4½-min firing does the job.

The size of the installation is remarkable in itself. In all, a total of 237 different type parts, ranging in size from 2 sq in. to 31 sq ft, are handled. Each house is made up of 1071 of these pieces and has a total surface of approximately 7600 sq ft. On a 100 house-per-day program, therefore, approximately 760,000 sq ft are processed every 24 hr. About one-half this area is on the exterior parts which receive the two-coat enamel—a ground coat and an acid-resisting covercoat having a total thickness of approximately 0.010 in. The other half of the total surface, the interior paneling, is given the single coat and requires only one firing. This finish is approximately 0.007 in. thick.

Two unusual examples of what can be accomplished in solving complex handling problems through the use of modern material handling equipment, combined with electrical controls, are described by the author. One system involves the automatic conveying, and repeating, of various sized bars through a rolling operation, while the second system handles 10,000 drums per 8-hr shift, permitting the selective shunting of drums to any one of 32 delivery points. The rather novel controls used in these operations are discussed.

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Two Unusual Material

EFFICIENT, trouble free operation of modern material handling equipment requires the solution of many interesting problems, both mechanical and electrical. There are many ways of applying power to a conveyor but, in the author's opinion, the best equipment is electrical. There are definite advantages in its use; it is clean in operation, neat in appearance, operates quietly and reliably with approximately 98 pct dependability. Electrically operated conveyers can be made completely automatic by electrically operated loading and unloading devices.

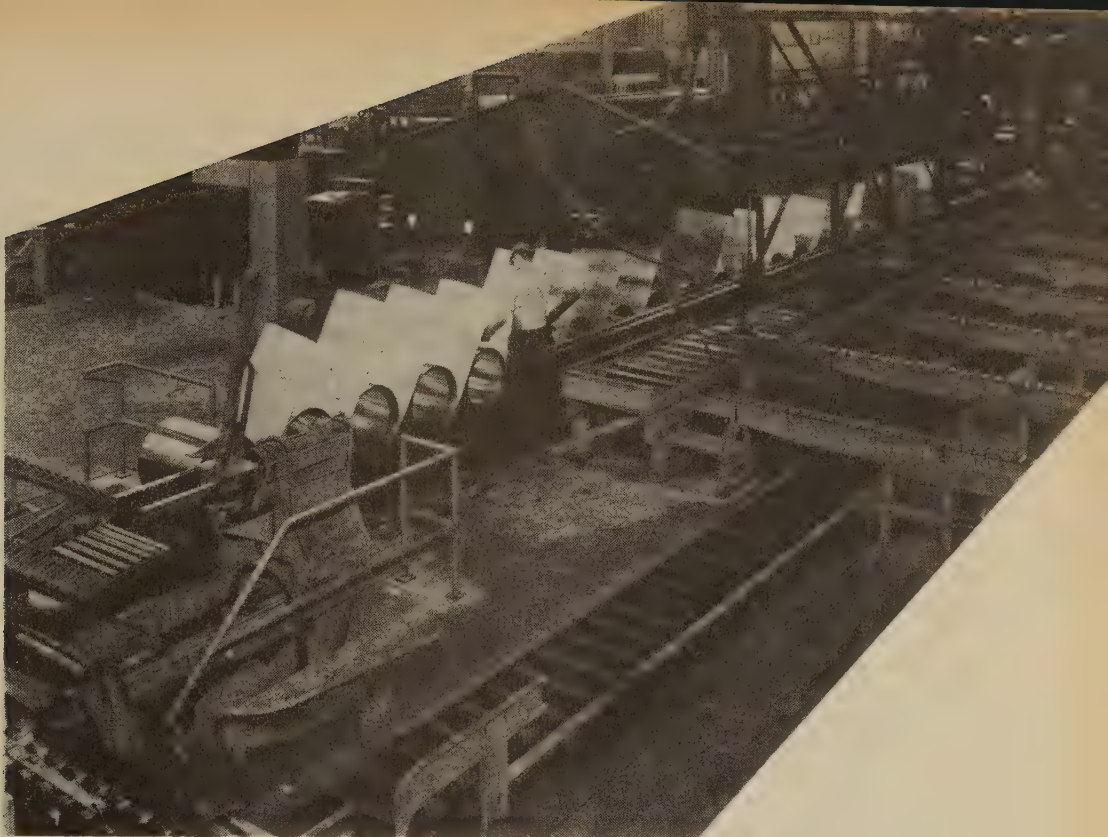
This article is an extended abstract of a paper presented at the Materials Handling Machinery Manufacturers Conference held at Westinghouse Electric Corp., Buffalo.

As an example of modern electrically operated conveying equipment consider a system used for the purpose of conveying individual brass bars of widths varying from 9.9 to 20.5 in., lengths approximately 30 ft and thickness from $\frac{1}{2}$ to $\frac{3}{4}$ in. A stack of bars is placed by crane on a 22 ft 6 in. long, 5 strand heavy pack chain conveyor, indicated at A, fig. 1. This is a 6 in. pitch roller chain with the chain spaced on 4-ft centers. The conveyor is driven by a 20 hp, 1160 rpm, type CSP induction motor, Class

2, ball bearing, high starting torque with low starting current. The electrical current characteristics in this system are 3 phase, 60 cycle, 440 v, with the control circuit designed for 110 v.

Conveyor A, fig. 1, is manually controlled by means of a pushbutton station and is advanced the width of the stack plus a few inches in order to allow sufficient clearance for the next stack. This is continued until the conveyor is filled. The first stack cannot advance beyond limit switch (LS-1, fig. 1), for contacting the limit switch will prevent further advancement beyond this point. Bars are now placed individually by means of a vacuum unstacker B onto a 60-ft long chain driven live roller conveyor C, with $4\frac{1}{4}$ in. diam rollers, 30 in. long on 12 in. centers. The speed of this table is 200 ft per min and is driven by a 3 hp, 1100 rpm type CSP punch press motor with brake.

The bar now travels over conveyor C to the first of a tandem 2 high-mill. From the first 2 high-mill, the bar is conveyed to the second 2 high-mill by means of a 25-ft long chain driven live roller conveyor D traveling at 200 ft per min and is driven by a 3 hp, 1100 rpm motor of the same type as described above. The



Handling Systems . . .

outlet from the second 2 high-tandem mill is a 53-ft long chain driven live roller conveyer E with a surface speed of 250 ft per min. This conveyer, like the preceding live roller conveyers, is driven by a 3 hp, 1100 rpm motor.

If it was desirable at this point to reroute the bars back through the mill for a second, third and even a fourth pass, this could be accomplished by various methods. However, it is desirable to retain the bar in a horizontal plane and automatically return it to the first 2 high-mill. To accomplish this feat, it required right angle transfers at four points, shown in fig. 1 at E to G, G to I, I to K and K to C.

The bar lengths and widths vary, hence some means must be found to compensate for these factors. First, to minimize the distance a bar must travel for returning to the mill it is desirable to operate the right angle transfer by the rear end of the bar. This then leaves the operation independent of the length of the bar. As the bar emerges from the mill, it intercepts light beam of phototroller, P-1 in fig. 1. Both the N.O. and N.C. contacts of the phototroller are utilized at this time, as shown in fig. 2. The N.O. contact energizes a timer, TR-1, and the N.C. contact is in series with the N.O. con-

tact of the timer TR-1 and the coil of a relay CR-1.

When the light beam is intercepted, the N.O. contact of the phototroller closes and energizes the timing relay TR-1. The N.C. contact opens, thus preventing the relay CR-1 from being energized. As the rear end of the bar clears P-1, the N.O. contact opens, de-energizing the timing relay TR-1, but its contact remains closed from two to three seconds or of sufficient time to allow for the closing of the N.C. contact of P-1 relay CR-1 to be energized. This relay through its contacts stops the live roll conveyer E, fig. 1, at the exit of the mill. At the same time, an air-operated reciprocating pusher F goes into operation driven by means of air cylinder through a rack and pinion pushing the bars off the live roller conveyer E onto a 28-ft long, 7-strand chain transfer conveyer G.

This conveyer G is idle, except when the front edge of the bar intercepts the light beam of a second phototroller, P-2, which starts this chain transfer conveyer. At the end of the stroke of the reciprocating pusher, a limit switch is contacted which returns the pusher and starts conveyer E.

A second problem is confronted at this point

because of various widths of bars. If the bars were the same width, the chain conveyer G could be stopped an equal amount each time. This would evenly space the bars on this chain conveyer which is of a fixed length and is used to convey bars at right angles to a return live roller conveyer I. The spacing must be so regulated that when one bar is received on the chain transfer conveyer, another bar will be discharged at the opposite end. The bar widths are consistent as long as they are running a particular size of bar through the mill. However, there is a possibility that during a day's run, the bar width may be changed several times. The limit switch used to stop the chain transfer conveyer could be adjustable to cover the range of bar widths, but such adjustment would be slow and complicated.

The idea was conceived of constructing several pin wheels, one for each bar width and mounting on these wheels pins so spaced that this spacing would represent the bar width plus clearance. These wheels, approximately 18 in. diam, are mounted on a common shaft supported by ball bearings, with the shaft driven from the head shaft of the chain transfer conveyer G by means of chain and sprockets. The pins on the wheels are used to operate an adjustable dog that can be slid along a second shaft adjacent to the pin wheel shaft and, by means of a hand screw, clamped to this shaft opposite the corresponding wheel. The pin on the wheel operates the dog which in turn trips the limit switch.

When conveying, say 12-in. wide bars, the wheel with a pin spaced for 12 in. bar widths is used. To place this in operation, the dog is moved until it is opposite the corresponding 12 in. pin wheel. The chain transfer conveyer G is started by phototroller P-2 as described previously and continues to operate until a pin on the 12 in. pin wheel spacing contacts the dog which trips the limit switch. This stops the chain transfer conveyer G. This setting is retained as long as this width of bar is being conveyed. If the next bar width should be 18 in., then the pin wheel with pins spaced for 18 in. bar widths is used and the dog is simply moved opposite this wheel and the operation is the same as described previously. Such an arrangement offers an easy and quick means of adjustment for various widths bars and utilizes a standard limit switch and controls.

With the bars on the chain transfer conveyer, the next problem is one of transferring them from this conveyer to a right angle adjacent live roller conveyer I. As stated previously, the chain transfer conveyer G moves forward when the bar is transferred at the receiving end. Therefore, when this conveyer is filled, it means that when one bar is received, one bar is discharged. The front edge of a discharging bar intercepts a light beam for phototroller P-3 and completes a circuit which lowers a set of wheel arms, H, operated through a 6 in. diam by 7 in. stroke air cylinder and solenoid valve. The bar is deposited on a 110-ft long chain-driven live roller table, I, having a surface speed of 300 ft

per min and is driven by a 7½ hp, 1100 rpm type CSP punch press motor complete with brake.

When the bar intercepted P-3, lowering the wheel arms H, it also prevented the operation of the air pusher F at the receiving end while a bar intercepts P-3. A short time later phototroller P-4 is intercepted as a bar moves forward on conveyer I, and is used for raising wheel arms H as soon as the rear end of the bar clears P-4. The circuit is similar to that shown in fig. 2. Phototroller P-4 prevents the air pusher F from operating while a bar has intercepted the light beam of this phototroller.

After the bar leaves the second right angle transfer, G to I, it is conveyed to a third transfer point, I to K, which operates in the same manner as the first one explained and then a fourth right angle transfer, K to C, the same operation as the second right angle transfer G to I.

When the mill has been shut down at the end of a turn, or for some other reason, the chain transfer conveyer can be cleared by means of a selector switch mounted on a control desk which transfers the circuit from phototroller P-2 to phototrollers P-3 and P-4. In this case, as the discharge bars clear P-4, the wheel arms H raise and the chain transfer conveyer G starts for the purpose of conveying the next bar to the live roller conveyer I. In this manner, the chain transfer conveyer is emptied of bars automatically.

After the bars have passed through the mill a sufficient number of times, they are conveyed to the leveler and roller conveyer M. The vacuum stacker N then stacks the bars on chain conveyer O. While the bars are being conveyed as described, the conveyers are so interlocked that if for any reason a bar could not move forward to its next position, the proceeding conveyer will stop.

Many manufacturers have the problem of receiving and storing materials and either shipping or warehousing the finished product. An oil drum installation, fig. 3, is typical of this type and involves approximately 2 miles of conveyers. Oil drums of 55 gal capacity, weight 500 lb, are fed onto a main dispatching conveyer by other conveyers which reach back into a refinery for about 500 ft. The main conveyer is to run at such a speed, as well as the incoming conveyers, that they will handle full drums at the rate of one drum every 3 sec or 20 per min. This means a peak capacity of 10,000 drums during an 8-hr shift.

The drums, after being filled in the refinery, are stenciled on the head of each drum with the proper marking. The drums are now conveyed by means of power conveyers to a dispatching operator, see fig. 3. The full drums at this point are to be segregated and shipped out to any given box car or truck. The problem faced here is having the full drums go to their proper designation for accumulation and held there waiting the attention of the loading crews. As the drums flow into the warehouse building, they all pass in front of a single operator,

whose duty is to segregate the drums according to shipping instructions. He must do this by registering each drum's designation by some mechanical or electrical means located in front of him. The operator must be capable of observing the designation markings, stenciled on the head of each drum and within a time cycle of less than 3 sec route it to the proper warehouse conveyer.

The drums now pass down the main conveyer, which has branches off into 32 different warehouse conveyers, each capable of holding an

is to travel at 100 ft per min and with a capacity of 20 drums per min, the spacing between drums will be 5 ft. Pushers, therefore, will be located on 5 ft centers.

Drums from the refinery approach the main line in a continuous flow. A drum escapement mechanism, consisting of pins between rollers and a plate stop, is used to feed the drums into the main conveyer, as shown in fig. 3. Normally the pins are up and the plate stop down. The operation cycle starts when a barrel from the refinery conveyers stops against the pins, which

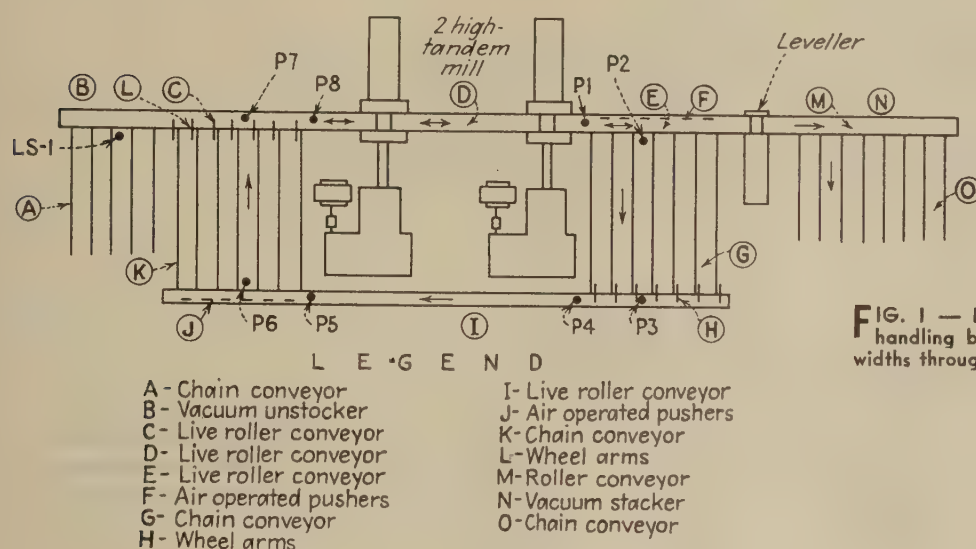


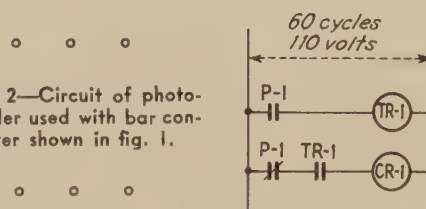
FIG. 1 — Layout of system for handling brass bars of varying widths through a two high tandem mill.

entire box car quantity of 80 drums. The mechanism set up by the operator must be capable of operating automatic deflectors, which at the proper time will feed the drums into the designated conveyer. This action may take place very shortly after the drum has been so designated by the operator or it may be several minutes later and any number of drums may be deflected consequently into the same warehouse storage conveyer. This system offers a continuous flow of drums to the loading area over the entire conveying system.

A full drum once put onto the conveyer at the filling plant in the refinery is not taken off the conveyer until it reaches its destination. This may be a railroad car, highway truck or the storage warehouse.

First, it is necessary to give some consideration to the best type of conveyer to be used for the main line as well as a method of feeding and deflecting from this conveyer. After much consideration it was decided that the main conveyer should be a pusher bar conveyer. This consists of a level line of roller conveyor over which is mounted pushers attached to two strands of roller chain, one chain on each side of the roller tread. The pushers are the width of the roller conveyor plus clearance and are set above the tread a fixed distance in order to contact the drums. These pushers act on the drums and push them along the roller conveyor. There must not be more than one drum between a pusher at any one time. The main conveyer

FIG. 2—Circuit of photo-troller used with bar conveyer shown in fig. 1.



are in the up position. The drum then rests on a limit switch and as a pusher on the main conveyer contacts a second limit switch, a circuit is completed which energizes a solenoid air valve and permits an air cylinder to lower the pin and raise the plate stop of the escapement mechanism.

The drum then advances and rests against the plate stop. The pusher on the main conveyer contacts a third limit switch which de-energizes the solenoid valve and allows the air cylinder to lower the stop, raise the pins, and permits the drum to flow onto the main conveyer just ahead of a pusher. The drum is now contacted and literally pushed on the main roller conveyor tread to the dispatcher and the warehouse storage lines.

After the drums pass the operator they are dispatched to 32 branch or lateral conveyers constructed at right angles to the main conveyer and on approximately 4-ft centers. These conveyers are chain-driven live roller type,

with sprockets mounted on each roller over which passes a continuous driven roller chain. The purpose of these conveyers is to convey the drums away from the main conveyer, act as storage area for 80 drums and later convey the drums to box cars and trucks for shipping.

A positive and quick method was designed for transferring the oil drums from the main conveyer onto the lateral conveyers. This consists of an air-operated deflector with the deflector arm moved back and forth vertically across the main conveyer line. The face of the deflector was lined with wheels to minimize

be necessary for the operator to actually come in contact with the drum by placing a colored sticker, flag or pin on each drum. There is also the problem of returning these pins or flags to the dispatcher. This is a conveying problem within itself.

The idea was conceived of considering a miniature conveyer so geared that a certain amount of travel on this unit would represent an equal amount of travel of the main dispatching conveyer. This miniature conveyer could be circular in nature and driven from the head or tail shaft of the main conveyer. In this way the

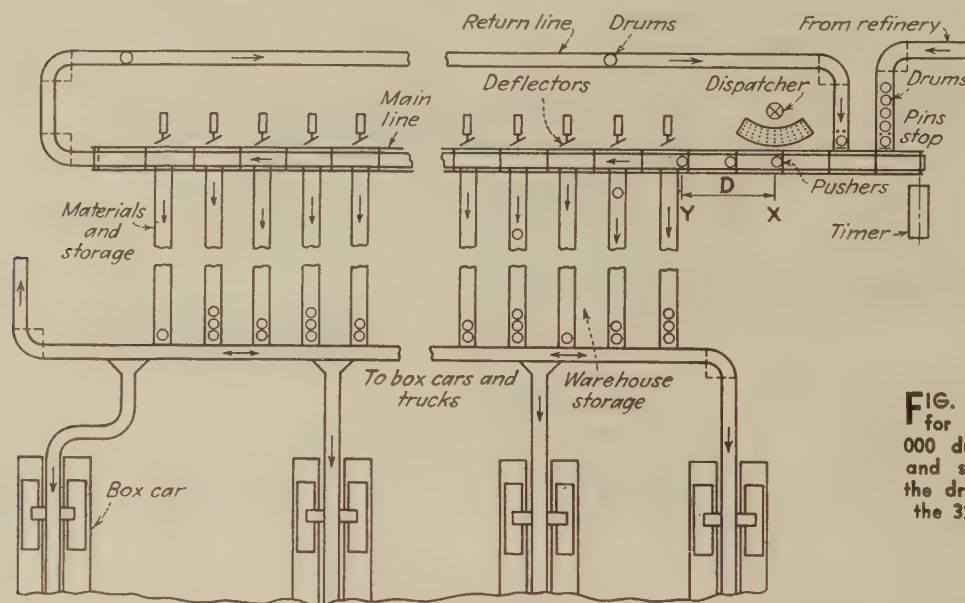


FIG. 3—Conveyor system for handling up to 10,000 drums per 8-hr shift and selectively delivering the drums to any one of the 32 lateral conveyers.

friction between the drum and the deflector.

The importance of the time element can be realized when a 3 sec cycle is considered. This allows 0.5 sec for the deflector to move out, remain in the out position for 1.8 sec, return in 0.5 sec and a dwell time of 0.2 sec. An electric impulse set up by the dispatcher, after he has determined the proper designation of an oil drum, causes the deflector to move forward as a drum is approximately 10 in. from the deflector and to remain in this out position for 1.8 sec. In the meantime, the pusher on the main conveyer pushes the drum against the deflector wheel arm and pushes the drum onto the right angle adjacent lateral conveyer.

There are many methods by which the operator may select a drum for a specific designation, such as using a color scheme and photoelectric relays. But because of the numerous designations and laterals, this would require many colors and proper position of these colors on the drums in order to deflect them at the correct points.

Another method might be to attach to each drum a flag or some other device which in turn would operate a limit switch for operation of the deflector at the proper designation. Still another might be to insert pins on a dummy which would travel ahead of the drum with the pin being used to operate a limit switch at the required lateral. In all of these cases it will

miniature conveyer would be synchronized with the main dispatching conveyer at all times.

The speed with which the main conveyer is traveling and with the time allotted to the dispatcher, one drum every 3 sec, makes it desirable that the miniature conveyer be so constructed that the operator will have time to make his selection and also allow sufficient clearance for the deflector to operate and be returned to its normal position for the second drum to be deflected at this point or pass by to some other lateral.

The miniature conveyer will be made with pins mounted in a disk located on a 27.230 in. diam pin circle, with the pins spaced 1.500 in. apart. The 1.500 in. on the pin circle is to represent 5 ft of the main conveyer travel, or 0.025 in. represents 1 in. of conveyer travel. This miniature conveyer is shown in fig. 4.

In this particular instance, a 6 in. pitch chain is used on the main conveyer and there are 10 teeth on the tail sprocket. This means that one revolution of this sprocket equals 60 in. or 5 ft of travel. Since there are 57 pins on the pin circle (fig. 4), for 5 ft of main conveyer travel the pin circle must advance $1/57$ th of a revolution. Between the tail shaft on the main conveyer and the shaft on which the pin wheels are mounted, there is an exact reduction of 57 to 1. It was found that one of these wheel units could serve two laterals and as 32 laterals were

needed, 16 disks or pin wheels were necessary.

The pins are mounted in the pin wheel in such a manner that they are centrally located and held in place by means of a spring and ball check. They can be moved, however, a short distance on either side of the pin wheel by some mechanical means, in this case, a solenoid. By moving them on either side of the pin wheels, one wheel can serve two deflectors. The face of the solenoid must be less than the distance between pins in order not to have two pins projecting at the same time. It is essential that the solenoid which operates the pin be energized by the dispatcher at the proper time and released as quickly as possible.

As previously stated, the dispatcher must note the stencil designations on the head of each drum and then make the proper selection. With the pin disk method, it is necessary for him when making the selection to energize a solenoid. The most simple method to do this would be to press a button at the proper time. The operator is located in a glass enclosed pulpit where he is in a position to observe each drum as it passes in front of him. As there are 32 laterals, it means that he must have 32 push-button stations, one for each lateral.

The drums flow past the dispatcher at the rate of one drum every 3 sec. This means that the dispatcher must make his choice within a period of less than this time. With the face of the solenoid $\frac{3}{4}$ in. wide, the dispatcher will be allowed 1.5 sec to make this selection. After he has made his selection by pressing the button, the solenoid is energized causing one of the pins to be projected in a manner that later it will contact a limit switch. This limit switch is mounted around the pin circle and the distance will vary for each wheel depending upon the distance from the dispatcher to the corresponding laterals.

The pin upon contacting the limit switch just prior to the time that a drum is to be deflected will, through a relay, operate a solenoid valve which in turn operates the air cylinder causing the air operated deflector to move out vertically in front of the on-coming drum. The drum is then deflected onto one of the storage laterals and as soon as it clears the main conveyer the deflector is returned to its original position. The distance from the time that the solenoid is operated to project the pin until the pin contacts the limit switch is the same time it requires the drum to pass the dispatcher until it arrives a very short distance away from its designated lateral.

The distance from a point in front of the dispatcher to an oil drum almost in front of the first deflector will be called distance D (see fig. 3). Now in fig. 4, the distance from the solenoid to the limit switch LS-1 is $\frac{1}{57} D$. The time it requires the drum to go distance D on the main conveyer is the same time it requires pin P (fig. 4) to travel $\frac{1}{57}$ th of D on the miniature conveyer.

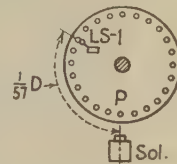
The dispatcher presses the button when the drum is in front of him at point X (fig. 3) and

then the solenoid pushes out pin P on the miniature conveyer at the corresponding time. When drum reaches point Y (fig. 3), pin P contacts LS-1. This causes deflector No. 1 to move out in front of the drum to be deflected onto first lateral. In this case there are 32 laterals, therefore, there will be as many limit switches as there are deflectors and the setting of the limit switches around the pin circle will vary for each lateral depending upon the distance of that lateral from the dispatcher.

These pin wheels are all mounted on a common shaft which is supported by ball bearings and accurately driven from the main conveyer through an exact ratio reducer. The limit switches can be adjusted by means of micro screws within a tolerance of 0.025 in. representing 1 in. of conveyer travel. This means of preselecting the proper deflectors offers a simple and reliable method by which one operator may preselect the proper designation.

Such a unit, which can be called a pin wheel

FIG. 4—Diagram of the control wheel used by the operator to select a specific destination for a drum. Normally, the wheel has 57 stations, but only 24 are shown here for clarity.



timer, can be used for a few selections or for numerous stations as has been described. After the drums have been stored on these laterals, they are then moved over these live roller conveyers and other conveyers to the box cars and trucks for shipping. A return conveyer makes it possible to return full drums to the dispatcher in case a drum goes past him and he has not made a selection.

This article has attempted to give several illustrations where electrical controls have played an important part in the continuous flow of materials. In the first case, it was noted how bars of brass were conveyed automatically several times through the mill without manual effort. While conveyers were available that would handle the commodity being conveyed, it was necessary that the automatic operation be taken over by electric controls—in this case, phototrollers, limit switches and relays—to insure a positive automatic operation.

In the drum handling case it was shown how it is possible for one man to operate what might be called an electric memory device and successfully move drums by continuous flow from the refinery to the warehouse for storage and shipping. When it is considered that there may be approximately 40 drums on the main conveyer at one time, all preselected for the same or any of the 32 different destinations, the importance of this type of an electric controller in the conveyer industry can be visualized.

Metal Powder Meeting

CONTINUING the steady increase in attendance that has been evident since its first meeting, the Metal Powder Assn. attracted a record turnout of some 350 executives and technicians to its fifth annual meeting and exhibit, held in Chicago last week.

Consisting of a technical program and an exhibit of the products of parts fabricators, press and furnace manufacturers, powder producers and powder handling and testing equipment makers, the two-day session furnished the registrants with a comprehensive roundup of many of the phases of powder metallurgy. Particular emphasis was placed, in this meeting, on the practical aspects of the subject, and it was of interest to note the vein of self-criticism exhibited by members of the industry.

An election of officers, the first to be held at an MPA annual meeting, resulted in the selection of B. T. duPont, sales manager, Plastic Metals Div. of National Radiator Co., as president; T. L. Robinson of the Wel-Met Co., as vice-president; and Virgil Price, vice-president and manager of Pyron Corp., as chairman of the board. Robert L. Ziegfield was re-elected acting secretary. New directors elected were W. P. Schenck, superintendent, Scrub Oaks Div., Alan Wood Steel Co., and F. F. White, vice-president of S. K. Wellman Co. The following continued as directors of the association: M. A. Hunter, Federal-Mogul Corp.; T. R. Moore, Antara Products Div. of General Aniline & Film Corp.; and G. H. Tulley, Metals Refining Co.

Guest speaker at the annual luncheon was Joseph Zimmerman, editor-in-chief of the *Daily Metal Reporter*, who discussed the current metal situation.

Touching upon many phases of powder metallurgy, such as tooling, pressing equipment, design procedures, and powder costs and characteristics, J. L. Bonanno described the extensive expansion of this method in the activities of the Lionel Corp., in his formal presentation "Powder Metallurgy from the Design Engineer's View point."

An example of studied application of powder metallurgy to a toy locomotive is shown in fig. 1, where, in all, 34 individual parts are now being produced by this process. The speaker discussed in detail various components, illustrated the manner in which each part had formerly been

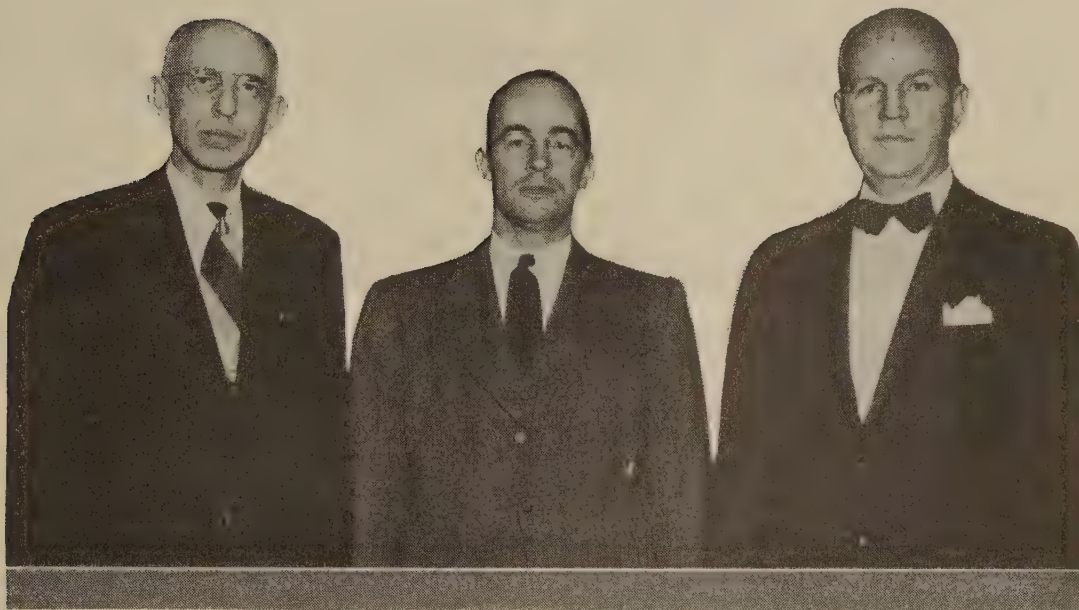
made, and indicated the savings in cost and material that were realized by converting to powder metallurgy.

Calling the attention to the advantages accruing from in-plant production, Bonanno stated that besides the normal manufacturing profits, savings were also obtained in transportation, crating, handling and storage of finished parts, close inventory and production controls and relative freedom to make changes in design to facilitate manufacture or to improve the product. When other processes, such as hardening, annealing, plating, etc., are used in the manufacture of the product, for example, they can often be most advantageously dovetailed with in-plant fabrication of powder metal parts, with consequent economy in handling and processing.

Concerning processing machinery employed, Bonanno held that while powder metal presses are generously designed, the relatively large number of moving parts, operating under high stress and almost completely exposed to the highly abrasive metal powder, make the rate of wear the highest of any production equipment in Lionel Co.'s experience. He suggested several modifications to existing equipment, incorporating: (1) enclosure and sealing of all moving parts including the motor, (2) factory installation of a "one shot" or similar pressure lubricating system to force out any impacted material and to lubricate those components which are not working in lubricant, (3) simplified die changing and press adjustment with particular emphasis on maintaining both lateral and radial alignment, (4) standardization of tool-mounting dimensions among press manufacturers, and (5) an improved ejection system.

Bonanno also touched upon other opportunities for powder metallurgy. One such opportunity lies in the perfection of a technique for pressing magnetic structures operable at high flux densities at commercial power frequencies. Although considerable success has attended the use of sintered parts for dc motors, magnetic characteristics suitable for ac applications have not as yet been achieved. The metallurgical problem, which involves securing a dense structure of high resistivity and small equivalent air gap, might be solved by developing large flaky powder to simulate a laminated structure having a high resistivity particularly in the direction

5th annual convention attracts record turnout . . . duPont elected MPA president . . . Economies of powder parts in toy trains described by Bonanno.



NEWLY elected officers of the Metal Powder Assn. are Virgil Price, chairman of the board (left); B. T. duPont, president (center); and T. L. Robinson, vice-president (right).

of pressing. A short equivalent air gap would also result from the overlapping of flakes rather than the butting of rounded particles. Another possibility would lie in the direction of increasing the saturation limits of materials with extremely high resistivity.

Importance of this latter development to the metal powder industry, stated Bonanno, can be inferred from the fact that some 100,000 tons of low grade electrical steel is sold annually for small ac motors and transformer and reactor laminations, compared with the 6000 tons of iron powder used for pressed parts in 1948.

Oxygen, in the form of oxides, represents the major impurity in most metal powders, and qualitatively, oxygen is considered to be detrimental to the overall performance of metal powders. The scarcity of data available on the direct effect of oxygen on the performance of metal powders led the Buel Metals Co. to conduct an investigation of iron powders having a wide range of oxide contents, and the initial series of tests were described by J. J. Cordiano in a paper entitled "Some Effects of Oxygen on the Performance of Iron Powder."

From a group of some 60 powders, 18 were selected and blended to form seven powders

having the characteristics listed in table I. An additional high apparent density powder (powder No. 12) was also included. Powders Nos. 1 through 4 and No. 12 had the natural particle size distribution resulting from screening through a 100-mesh screen the pulverized product of the reduced cakes. The group of powders used to make powders Nos. 5 through 7, because of somewhat high fines content, were separated into screen fractions and the fractions blended together in the proportions indicated in table I.

Although considerable effort was made to hold constant all factors but the oxide content, the results indicated that this was not accomplished. A plot of tensile strength and elongation v. hydrogen loss indicated the influence of some undetermined factors; nevertheless, the sustained mechanical properties of sintered test bars made from the higher oxide content powders could not be ignored.

These properties were all the more remarkable when considering that a sharp decrease in densities of sintered bars was obtained from the higher oxide content powders. The speaker attributed these results to the manner in which the voids were distributed.

In table II are shown results obtained with

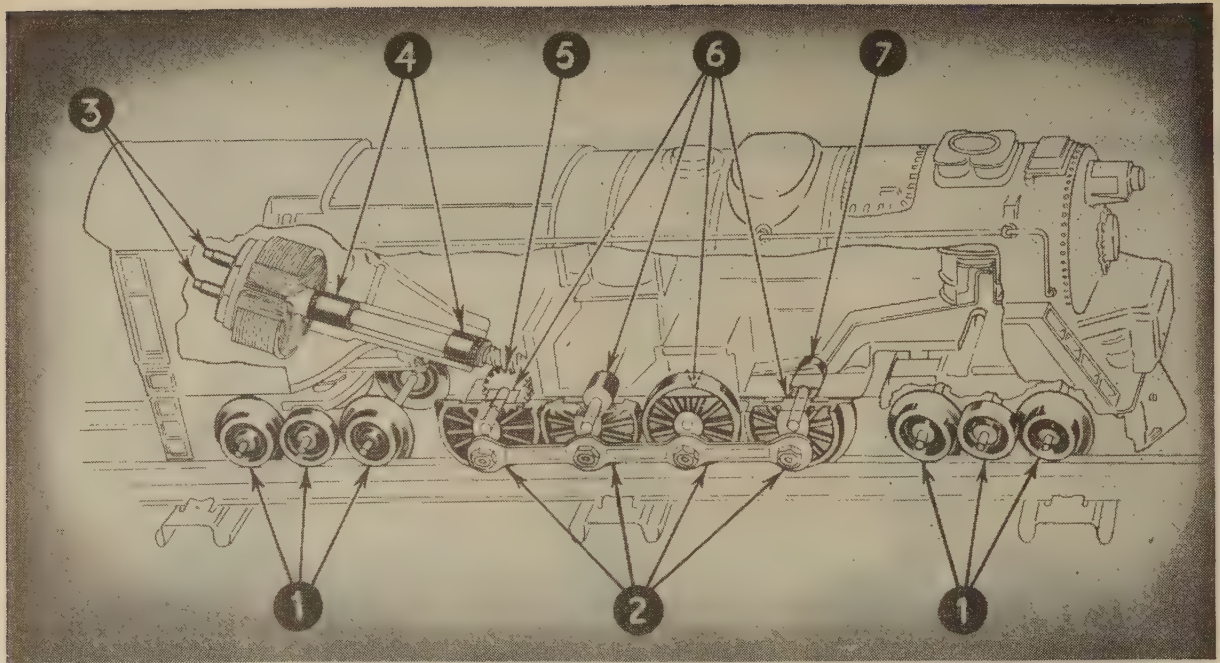


FIG. 1—The Lionel toy locomotive contains 34 parts made by powder metallurgy. Components shown on the sketch are as follows: (1) car wheels, (2) drive wheels, (3) brushes, (4) bushings, (5) helical gear, (6) bushings, and (7) cam.

the No. 12 powder. Similar data (not included in this report) was presented by Cordiano, pertaining to the other seven powders. From the results of the experimental work outlined, it appeared that internal oxides in iron powders do not materially affect the mechanical properties of sintered iron compacts, but do have a strong effect on decreasing the density of green and sintered compacts. In addition, volume and linear shrinkage increase with increasing internal oxide content.

In his paper entitled "Tolerances of Finished Metal Powder Parts," W. R. Toeplitz, vice-president, Bound Brook Oil-Less Bearing Co., critically explored the manner in which the powder metallurgy industry has misrepresented itself as regards dimensional tolerances.

Employing as examples drawings of structural parts, which also showed inspection results on actual samples, each of which was produced by a different manufacturer, the speaker showed ways and means whereby powder metallurgy had evidently been misrepresented, as judged by inability to meet drawing specifications.

In one case, a gear angle was specified as 1 min—it was actually 44 min; a bore tolerance of 0.0005 in. was exceeded by 80 pct; a length dimension of 0.004 in. was exceeded by over 200 pct; and a 0.0005 in. OD was exceeded by 60 pct. In the case of an iron slide block, a natural for powder metallurgy, already containing broad tolerances, many of them totalling 0.020 in., the tolerances were exceeded by a wide margin.

Concerning these and other typical examples, equally incompatible with specified dimensions, it was Toeplitz's conclusion that liberalizing the tolerances had no effect on bringing parts within the limits—it merely seemed to increase the margin by which the tolerances were exceeded.

Turning his attention from the making of structural parts, the speaker indicated that a more realistic attitude exists in the production of bearings; first, ASTM and SAE specifications apply, and second, a designer realizes that to obtain closer tolerances on bearings, he must pay a premium. Since bearings are critical units, experienced purchasers are concerned primarily

TABLE I

Characteristics of Eight Iron Powders Possessing Different Apparent Densities

Powder No.	H ₂ Loss, Pct	Apparent Density, G per cc	Flow Rate, Sec for 50 g	Screen Analysis, Pct					
				-80	-100	-150	-200	-325	-325
1	0.09	2.06	30.6	1.1	20.6	43.4	22.2	12.7	
2	0.21	2.07	29.8	0.7	22.0	29.9	28.2	19.2	
3	0.36	2.05	30.6	0.5	22.1	30.5	28.5	18.4	
4	0.64	2.07	31.2	0.8	23.8	36.3	23.3	15.8	
5	1.29	2.09	30.4	0.6	21.7	31.1	27.8	18.8	
6	1.83	2.10	32.2	0.3	19.2	32.1	29.3	19.1	
7	3.77	2.02	32.4	0.5	18.4	31.8	29.6	19.7	
12	0.14	2.43	24.8	0.5	23.8	32.2	23.7	19.8	

TABLE II

Physical Properties of the Iron Powder Identified as No. 12

Density, G per cc	Weight Loss, Pct	Shrinkage		Tensile Strength, Psi	Elongation, Pct in 1 in.
		Volume, Pct	Length, Pct		
Green	Sintered				
5.45	5.47	1.03	1.44	11,032	3
5.44	5.46	1.06	1.40	10,620	4
6.22	6.20	1.05	0.71	16,406	4
6.21	6.19	1.07	0.74	15,120	3
6.65	6.60	1.05	0.32	18,535	3
6.65	6.61	1.07	0.46	17,880	2
6.74	6.72	1.05	0.70	18,767	2
6.73	6.71	1.07	0.82	18,105	3

with quality, and are quite suspicious of tremendous savings. They police quality with adequate incoming inspection and usually have no hesitancy in rejecting off-dimension bearings.

Listing some 94 raw material and processing variables—incorporated under the significant classifications; powder (major powder, minor powder, lubricant), mixing, forming tools, forming press, formed compacts, sintering, sizing tools, sizing practice, compact to be sized and inspection—the speaker briefly outlined the influence of these variables in introducing difficulties to meeting dimensional specifications for structural parts. He pointed out that from a thorough knowledge of the variables in the process it is quite possible to predict which tolerances are practical and which controls and corrective operations must be employed to achieve them; also which dimensional limits must be liberalized.

Expressing enthusiasm for the future for

structural parts by powder metallurgy, Toeplitz called for (1) more work on the standardization of dimensional tolerances of odd-shaped parts, and (2) advising the customer of dimensional concessions that may be required, so that necessary corrective measures can be taken in advance.

Other interesting papers presented at the technical sessions were as follows: "Hygiene in the Metal Powder Industry" by D. R. Johns, M.D.; "Selling Parts Made from Metal Powders" by

¹ *The principles of the magnetic clutch were illustrated in THE IRON AGE, March 24, 1949, p. 90.*

Morris Boorky, president, Presmet Corp.; "Effects of Impurities in Metal Powders" by F. V. Lenel, Rensselaer Polytechnic Institute; and "Characteristics of Materials Involved in the Magnetic Fluid Clutch" by H. D. Saunderson,¹ National Bureau of Standards.

Pressing Tubes Into Axle Housings

SEVERAL sizes of power driven industrial trucks built in the new Philadelphia plant of Yale & Towne Mfg. Co., employ the same cast steel rear axle housing. In each end of this housing is a long bored hole into which a steel tube is pressed. These tubes are left protruding beyond the ends of the housing to serve as dead axles about which the wheels turn.

As the capacity of the trucks increases, wider tires and wheels are employed and hubs become longer. This means that the tubes, all of which are of the same length, are pressed into the casting to different depths. To facilitate insertion to any specified depth, a special press here illustrated was built. Pressure is applied by a single hydraulic ram in a horizontal cylinder at the right end of the machine, the center line of the ram being in line with the axis of the axle housing which is mounted on a central carriage supported on ways.

The axle housing is set on and clamped to the carriage which, initially, is locked to the ways. A sleeve with an internal shoulder is placed on the ram and a similar sleeve is fastened to the stop or platen at the opposite end of the machine. In each shouldered sleeve is placed one of the tubes that are to be pressed into the axle, the outer ends of these tubes resting against the shoulder inside the sleeve.

When a lever operating a valve is moved, oil feeds into the hydraulic cylinder and the ram is advanced, pressing the tube into the hole at the right end of the axle. When the inner end of the sleeve on the ram contacts the end of the housing, the tube being forced into the axle housing hole is at correct depth. At this instant, the ram sleeve's inner end trips a latch that releases the carriage from the ways.

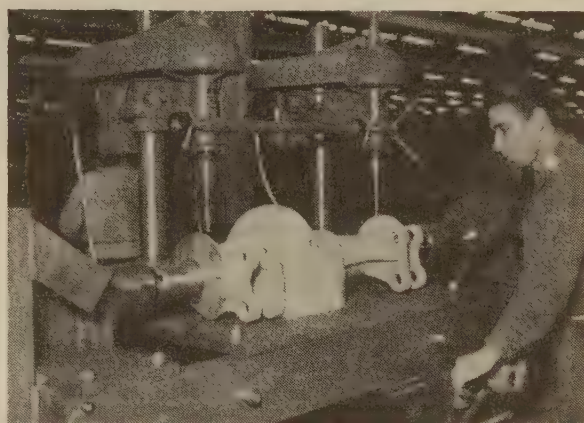


FIG. 1—By means of this horizontal hydraulic press and a variety of special sleeves, tubes are pressed to specified depths in axle housings for lift trucks.

Further motion of the ram advances the carriage as the tube at the left end of the housing is pressed into its hole. Motion continues until the inner ends of the two shouldered sleeves are in contact with the ends of the housing, at which point both axle tubes are at the specified depth, and motion stops.

Mounted on the carriage are two small drill presses and drills carried in these are lowered by hand to drill cross holes through the housing ends and tubes at each end. These holes are for rivets that are later applied to prevent axle tubes from turning or shifting endwise in the housing.

As soon as these holes are completed and the drills are withdrawn, the job in this machine is completed. The operating lever is reversed and the carriage is moved back to locked position and the assembly is unloaded. When a different length of tube extension is needed, pressure sleeves having shoulders set at different depths are employed, but no other changes are required. For each set of pressure sleeves, the length of axle tube left extending is uniform. The machine is faster and much more convenient than any conventional press would be.

Heating Seamless Tubes For Sizing

• • •

CONTINUOUS tube re-heating equipment of special design has been installed at the No. 2 seamless tube mill of National Tube Co., Gary. In conjunction with a huge, rotary, billet-heating furnace, the tube-reheating installation forms a major part of the modernization and rebuilding program recently completed on this particular mill.

The No. 2 mill, in its present form and with the new heating equipment, can produce tubes from 3 to 9 in. OD and up to 45 ft long. Billets are heated for piercing in the rotary-hearth furnace. Pierced tubes are reheated for sizing

in the line of the 13 new cylindrical chamber furnaces shown in fig. 1. There are five groups of two furnaces each connected to a 60,000 cu ft per hr gas combustion controller with the final three furnaces in the line, which are considered soaking units, connected to a single gas combustion controller of the same capacity. The first five groups of two furnaces each have automatic indicating-type temperature-limit control instruments to maintain the maximum desired temperature in the chambers but with limiting contacts to prevent overheating.

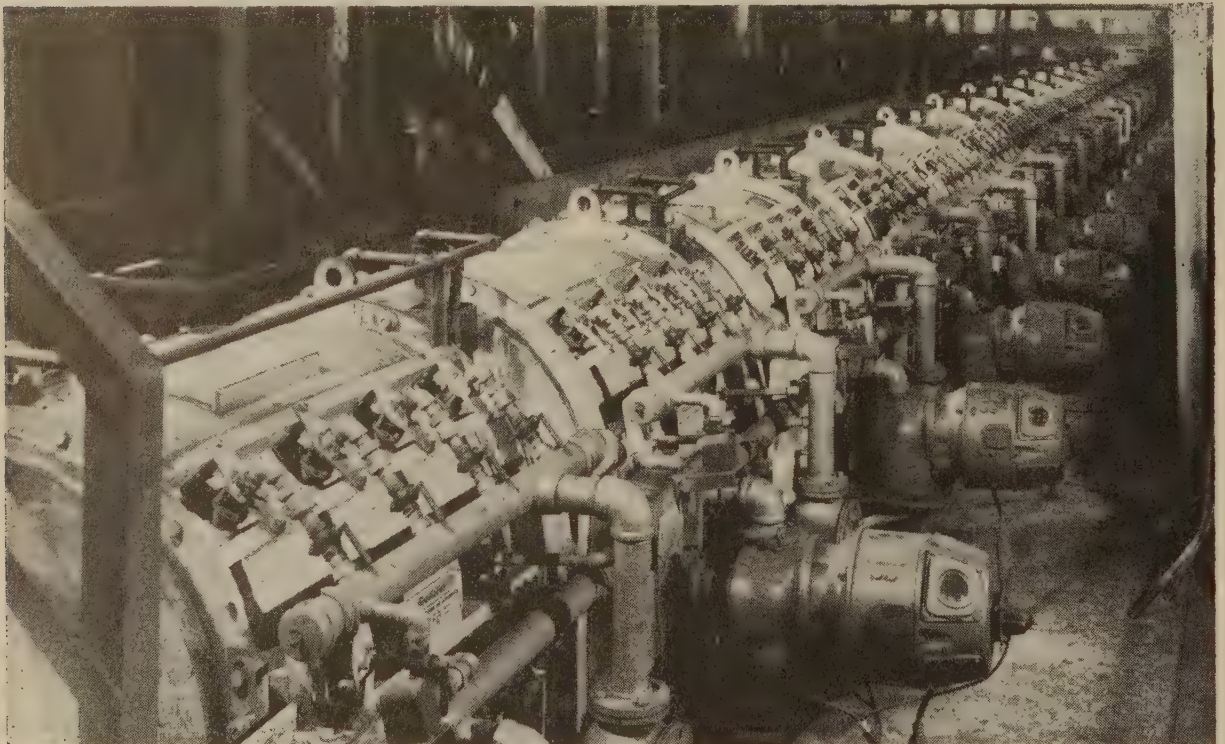


FIG. 1—View of the 13-cylindrical tube furnaces that form a continuous line for reheating pierced tubes for sizing in the Gary plant of National Tube Co.

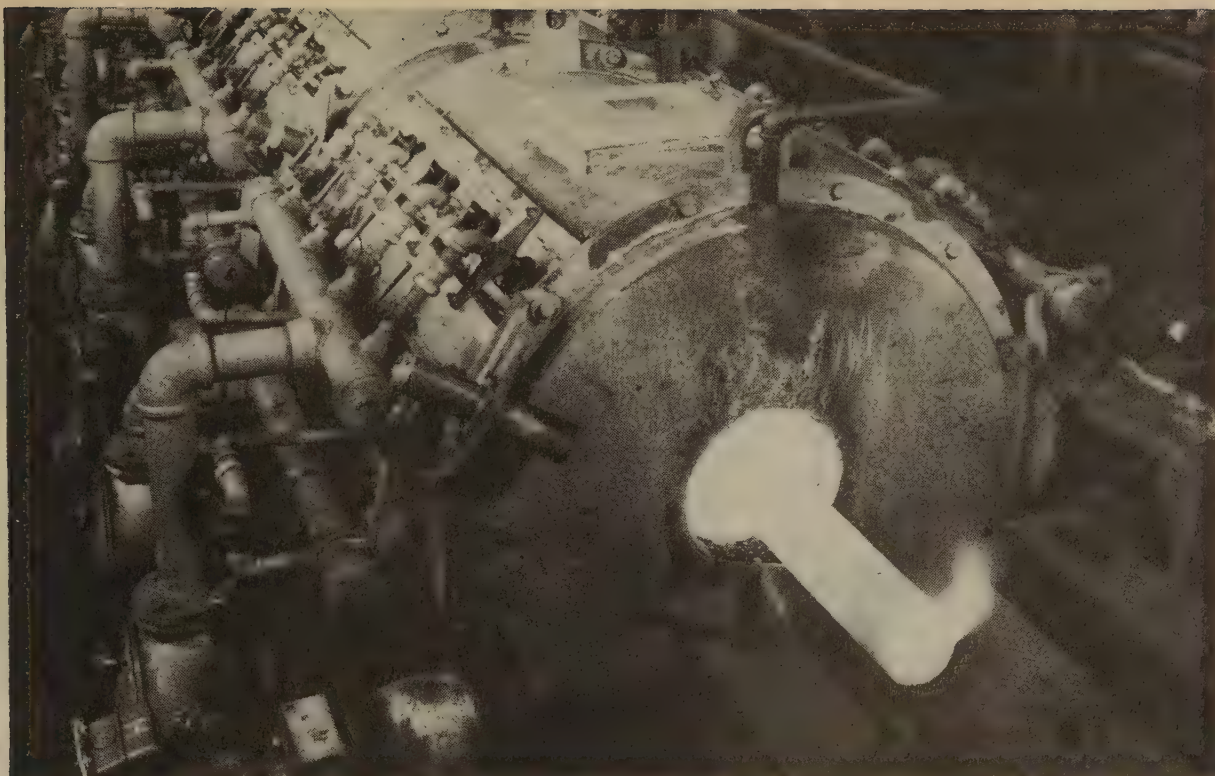


FIG. 2—Heated pierced seamless tube emerging from the line of furnaces. Note radiation type pyrometer supported at upper left of furnace end and sighted on the hot tube.

The final group of three furnaces (see fig. 2) is connected to a single instrument with the same limiting features.

Directly ahead of each furnace is a thermopile element connected to an indicating and recording control instrument which records the tube temperature before it enters the furnace, thus setting up the heat work to be done in the furnace through which the tube is about to pass. Under such an arrangement of control, if the tube or any portion of the tube enters

For additional information on the heating of steel tubing, see THE IRON AGE, "Gas Heating Speeds Seamless Tube Production," June 5, 1947, and "High Speed Annealing of Stainless Bars and Tubes," October 16, 1947.

the furnace at a temperature equivalent to the set point of that particular instrument, the furnace remains in a throttled condition. The furnaces, therefore, only operate at maximum gas-burning capacity when the temperature of the entering tube is below the set point of the instrument connected to that particular furnace. These controls are electrically interconnected with "electric eyes" which set up the control action and also with the temperature-indicating instrument.

Tubes enter the first group of furnaces at a maximum speed of 240 fpm for the full length of the tube, (see fig. 3). After the tube is completely within the line of furnaces, the speed of the conveyer rolls is automatically decreased to some lower manually-selected speed required for the particular diameter and wall thickness of tube being heated. When the tube has

traveled for the full length of the furnace installation at the selected lower speed, it is automatically discharged at the higher speed.

In the slow-speed circuit of the drive there is an adjustable rheostat that enables the operators to select the required slow speed. This selection is based on the diameter and wall thickness of the tube undergoing heating and required length of time necessary to reheat the tube from the entering temperature to the final discharge temperature of 1800°F. This low speed is adjusted to cover a range of tubes from 9¼ in. OD with 1.75-in. wall down to 2⅝ in. OD with 0.12-in. wall.

The 13 radiant-cup-fired heating furnaces are of cylindrical construction, and each has a heating chamber 3 ft 6 in. long equipped with a total of 16 radiant burners. Each radiant burner contains a burner tip in which there are a number of accurately-sized, uniform ports. From these ports the premixed gas-air supply is discharged under pressure, and directed so that each small flame sweeps the surface of the burner cup cavity. The surface of the cup acts as a radiant surface, with the degree of incandescence controlled by regulating the fuel-air supply. Heat radiated from the cup surfaces to the tubes, plus that in the fully-burned products of combustion, raises the temperature of the tube. All combustion takes place in the cup cavity, and no flame impinges on the tubes.

The furnaces are completely lined with refractory insulating brick to withstand a maximum operating temperature of 2700°F. All burners are completely manifolded with auto-

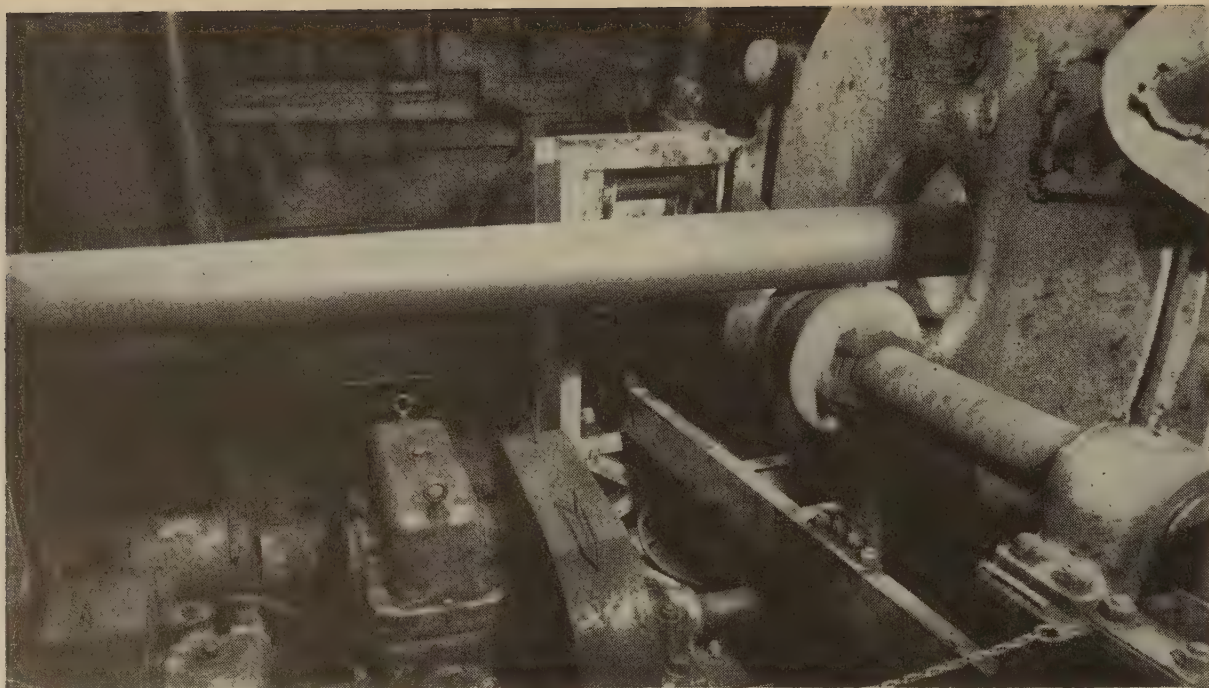


FIG. 3—Close-up view of a tube entering the first heating furnace. The mechanism in the lower foreground forms the drive for the cam shaft that adjusts the position of grooved rollers supporting tubes in their travel.

matic fire checks installed at each burner group. These manifolds are combined into a common connection to which are connected the automatic temperature control valves and source of air-gas mixture supply.

Six safety blow-out relief units were provided to permit the use of one unit at each of the combustion controllers. A raw gas manual reset magnetic shutoff valve was installed at the gas inlet of each gas-combustion controller to automatically shut off the gas in the event of gas-pressure failure, electric-power failure, or accidental flash-back. Each of these valves

incorporates a pressure switch. Each of the gas-combustion controllers is further equipped with a raw-gas-pressure regulator to reduce the 5-lb natural-gas supply of the plant to a pressure suitable for feed to the gas-combustion controllers. Each of the combustion controllers is also equipped with an indicating-type flow meter.

Either natural or coke-oven gas can be used as fuel. Use of coke-oven gas was made possible by development of special units for cleaning the gas to eliminate dust particles that might otherwise clog burner ports.

Ultrasonic Generators for Industrial Dust Control

ULTRASONIC generators large enough for industrial-scale smoke and dust control systems, treating 10,000 to 100,000 cfm of gas, are now a reality, according to a paper by H. W. Danser and E. P. Neumann, Ultrasonic Corp., Cambridge, Mass., presented at the recent meeting of the American Chemical Society in San Francisco.

Possessing acoustic power and intensity output many times greater than generators previously available, a siren-type unit has been successfully adapted for factory-wide control systems. One generator has been completed for the recovery of fine sulfuric acid fog particles carried in the exhaust stacks of a large acid manufacturing plant.

Sonic agglomeration is applicable to the recov-

ery or capture of visible fine particles smaller than one twenty-five thousandth of an inch in diameter. No lower limit on particle size is as-

See also "Sonic Agglomeration of Smoke and Dust," THE IRON AGE, April 7, 1949.

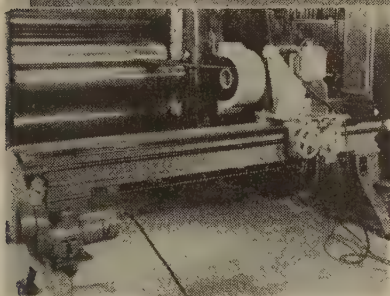
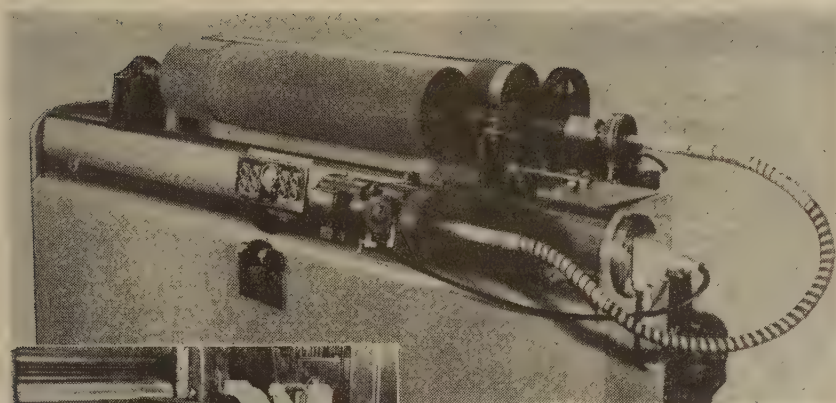
yet apparent, particles of less than 0.01 microns size being readily agglomerated.

Temperature does not restrict the use of the technique and particles can be agglomerated regardless of electric charges. Such systems are free from fire hazard.

The authors of the paper expect such control systems to be applicable in the smelting, petroleum, chemical, steel, carbon black, cement, lime and rock products, sulfur, paper and other industries. The systems are said to be more economical than other types.

New Production Ideas . . .

Roll grinders, an automatic brazing machine, arc welders and welding timers, a sheet edge control device, coating and gear gages, a force indicator, grinding fixtures, and a diamond dressing tool are described this week, together with a die handling truck, reel carriers, a parts cleaning machine, lifting magnets, a core binder, and a cleaning and pickling acid.



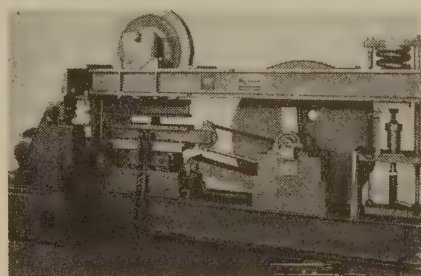
Roll Grinders

BELT grinding of rolls used in hot and cold rolling of steel, aluminum and other metals and plastics is the principle of a new machine marketed as the Integral Roll Grinder. The machine has two applications. The "in-machine" will grind rolls without removing them from the mill and the "out-machine" is used where rolls are taken out of the mills and brought to the grinder. Ways are eliminated and the problem of aligning the machine is reduced to a minimum. Heated rolls and cylinders can be ground without disturbing grinder alignment. An infinitely variable traverse is used to feed the grinding belt across the roll. The machine is insensitive to vibration, operation is simple, and roll cambers can be accurately ground. Grinding is controlled by a form roll and the work roll rotates on its own bearings. An air cylinder arrangement keeps the grinding belt

at constant tension. Grinding and chatter marks on the work are eliminated, and work can be ground wet or dry, although most applications will be dry. In dry grinding a 4000-lb form roll, 900 lb of metal was removed in 60 hr grinding time with a total roll runout of 0.012 in. The work was ground at 300°F, was reported truly cylindrical with a crown, and was not removed from the mill. *Ryman Engineering Co.* For more information, check No. 1 on the attached postcard.

Rolling Load Fatigue Machine

A NEW machine for applying rolling fatigue loads simulates service conditions on railroad rails to determine the endurance life remaining in rail sections with wheel-burned impressions caused by spinning locomotive wheels. Rail sections 50 in. long and up to



8 in. high are mounted longitudinally on a reciprocating carriage, 12 in. of the section being a cantilever. Loads ranging from 6250 to 80,000 lb are applied on the cantilever as it moves with a 12-in. stroke at 125 cycles per min. Maximum bending moment in the rail may be 960,000 in.-lb. The number of cycles to failure is registered by a revolution counter. The machine can be used for other purposes. *Baldwin Locomotive Works.* For more information, check No. 2 on the attached postcard.

DC Pneumatic Timers

A NEW dc pneumatic timer permits less than ± 10 pct variation from the mean timing period and is unaffected by normal changes in voltage and ambient temperature. The timing period is adjustable from 0.2 sec to 3 min by fingertip setting of a knurled knob or micrometer dial. Snap action contacts, normally open or closed in self-contained, arc-resistant melamine case, are rated for ac or dc control circuits. Electrical interlocks, operated by the magnet that actuates the timing mechanism, frequently eliminate need for additional switching relays. *Square D Co.* For more information, check No. 3 on the attached postcard.

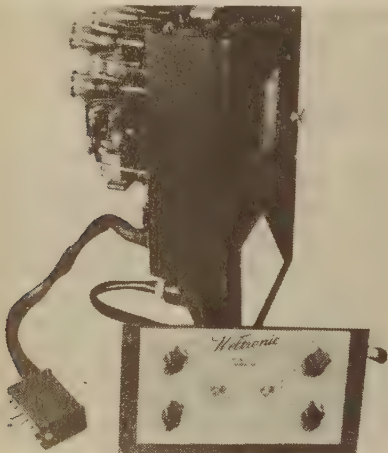
Special Brazing Machine

PRECISE application of closely controlled radiant gas heat in silver alloy brazing of brass sub-assemblies is the technique utilized in a special purpose automatic machine. The machine brazes 11 joints on 540 units per hr by the Selas Gradation method. Seven joints brazed simultaneously are gas-tight; four support joints are also brazed simultaneously. The machine has 46 ceramic gas-air

burners, each of which is adjustable with additional heat control provided at the four burner manifolds. Two turntables are controlled by a variable speed drive, synchronized to the requirements of heating time and gas volume. Pre-mixed gas and air are supplied to the machine in proportions for complete combustion and at constant pressure, by means of a combustion controller. This method of joining metals permits its application to standardized units of production and to units that are changed frequently. *Selas Corp. of America.* For more information, check No. 4 on the attached postcard.

Sequence Weld Timers

A NEW relay firing timer employs standard octal base thyatron tubes and is designed for interchangeable front or side mount of the timer dials when employed in a standard control combination. Timer panels incorporate plug-in, swing-out construction.

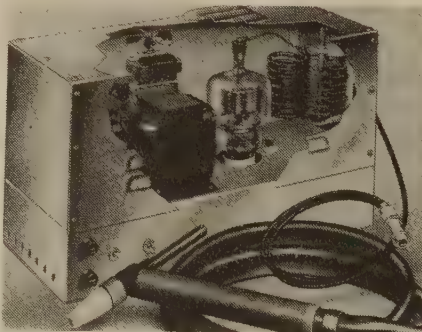


Time periods are independently adjustable. Relays are the heavy duty industrial type and pre-charged timing capacitors insure accurate timing. *Weltronic Co.* For more information, check No. 5 on the attached postcard.

Arc Welders

NEW welders for inert gas arc welding utilize a tube type oscillator with stable frequency characteristics, used with a specially modified torch providing maximum transfer of radio frequency energy. Spurious and harmonic radiation is reduced to levels permitted by the FCC. Arc stability is provided by the continuous, uninterrupted flow of high frequency power during the welding cycle.

Safety is assured by the circuit operating at ground potential; and maximum voltage at the torch is the welding voltage. Touch-start control provides automatic cold



starting. When the electrode contacts the workpiece, a 6-v control circuit is energized that turns on the high frequency. Only when the arc is drawn, welding current automatically comes on. Manual controls are the current regulator handwheel and an on-off switch for the oscillator. Models are manufactured in NEMA ratings of 150, 200, 300, 400, 500 and 750 amp. *Glenn-Roberts Co.* For more information, check No. 6 on the attached postcard.

Welding Regulator

A NEW welding and cutting regulator is made of aluminum with stainless steel wearing parts. A practical guard protects the fragile pressure gages. Design of working parts enables replacement of nozzle, seat, pin, and filter as a unit in 2 min, and only one socket wrench is necessary to service the instrument. *Oxo Welding Equipment Co.* For more information, check No. 7 on the attached postcard.

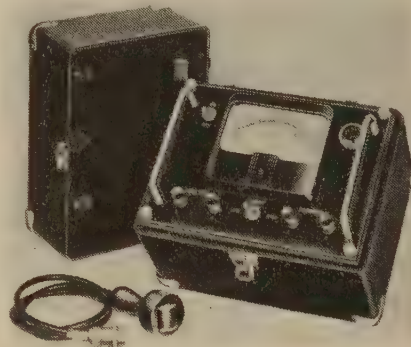
Edge Control

AUTOMATIC guiding and positioning of sheet materials in high-speed web and strip processing is provided by a new, integrally designed electronic control device, the VSP Edge Control. The unit permits continuous operation while accurately positioning strip at speeds as high as 3000 fpm. It is comprised of two sets of light sources and light sensitive receivers, one of which is placed on either side of the strip whose position is to be controlled, an edge control electronic exciter, a photo amplifier, an edge control generator set, and an edge guide motor. Operation of the equipment depends

upon the degree of unbalance between the two photo-tubes. The intensity of light in the room does not affect the operation. The VSP is recommended for use in steel, nonferrous and paper industries. *Reliance Electric & Engineering Co.* For more information, check No. 8 on the attached postcard.

Coating Thickness Gage

A NEW instrument for measuring thickness of non-magnetic coatings on iron or steel is known as the Coatingage. Measurements are made rapidly, without damage to the coating, and the thickness is indicated directly on the meter of the instrument. Two concentric scales cover a range of 0.0001 to 0.50 in. The Coatingage head contains a coil, connected to a bridge circuit. Coating thickness is measured by the effect of changes in the reluctance of the magnetic circuit. When the coil is in direct contact with the base metal the reluctance is low and the self-inductance of the coil is high. The bridge is then balanced for zero



thickness. An increase in the gap between the coil and the base metal unbalance the bridge, and causes current to flow through the indicating microammeter. Power is furnished by two 67½-v batteries and one 1½-v battery, contained in the instrument. Thickness readings are said to be within 10 pct of the actual thickness. The instrument is housed in a carrying case, 8x9x6 in., and weighs 10 lb. *Branson Instruments, Inc.* For more information, check No. 9 on the attached postcard.

Thermal Switch

THE Microsen thermal switch operates from a thermocouple input to signal temperature variations in heating processes. The signal is actuated by an electrical re-

lay. On and off switching of 10 amp at 115 v ac or 32 v dc is possible for any temperature setting from 100° to 2000°F. Larger electrical loads can be switched by means of intermediate relays. The thermal switch is also applicable to on-and-off control of electrically operated valves, warning signals, or motors. Standard ranges are 100° to 600°F, 100° to 1000°F, 400° to 1600°F, and 800° to 2000°F. The instrument is designed for 115 or 230 v, 50-60 cycle ac operation. Failure of any component will cause the relay circuit to open. *Manning, Maxwell & Moore, Inc. For more information, check No. 10 on the attached postcard.*

Force Indicator

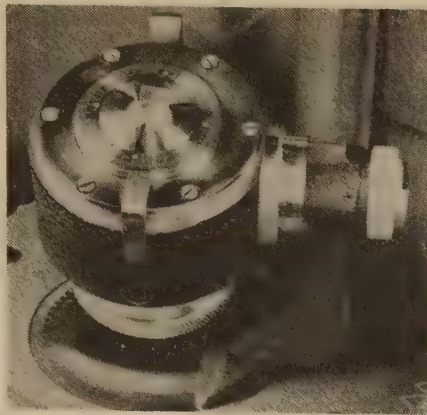
A NEW force indicator utilizes a precision compensated spring system to give accurate force measurements. The spring system is composed of three groups: the main compression spring, the compensating extension



spring, and the load-transmission rod-centering springs and the springs internal to the dial indicator. The force is applied to the system through a load transmission rod. Movement of this rod deflects the compensated spring system, and this deflection is measured by the dial indicator that indicates the force applied to the system. The instrument is shaped for one-hand operation. It has a capacity of 10 lb. *Hunter Spring Co. For more information, check No. 11 on the attached postcard.*

Insert Grinding Fixture

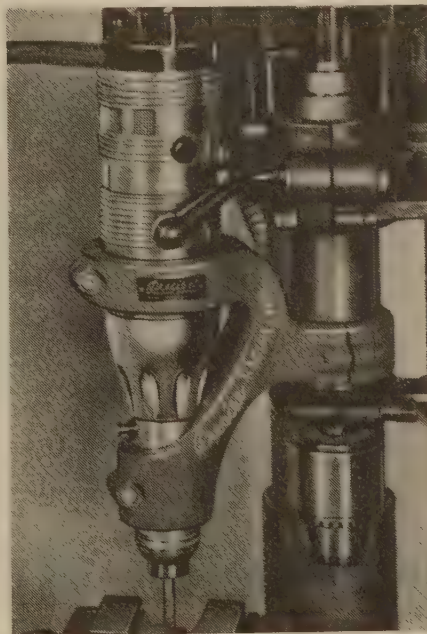
A FIXTURE for sharpening and grinding chip breakers on inserts provides ample clearance for grinding any insert with either flat or dished chip breaker. It is ruggedly constructed and designed for ready duplication of established grinds. Two calibrated setting dials provide for accurate adjustment in any position and cam index



plates speed up the grinding of rectangular, square and triangular inserts. The stop is lifted out of position for grinding round inserts. *Super Tool Co. For more information, check No. 12 on the attached postcard.*

Grinder-Miller

A COMPLETE line of tools and accessories adapts the new Super 40 grinder-miller to many tool or production setups in standard lathes, milling machines, drill presses or other stationary machine tools. It operates mounted wheels up to 1¼ in. diam, unmounted wheels, cutoff wheels and metal saws with special arbors up to 2 in. diam x ¼ in. wide, using



speed control, and HS midjet mills and carbide micromills up to ⅜ in. diam x 1 in. wide. The Super 40 features an aluminum-alloy housing, micro-precision ball bearings that never need lubrication, and rigidity and accuracy of quill and

collet chuck. The air-cooled motor is protected from overload by replaceable Fusetrons and is a complete unit with armature and field assembly in a self-contained cartridge that slips into the housing. Speed can be regulated within a range from 15,000 to 45,000 rpm. *Precise Products Co. For more information, check No. 13 on the attached postcard.*

Gear Gage

FOR a quick check of gears, a new shop model gear gage permits visualizing the size and strength of the teeth or checking the finished gear for diametrical pitch. It is not necessary to count the teeth of the gear or measure the outside diameter. The gage has 23 blades with 23 different diametrical pitches in 14½° pressure angles. The teeth are of the correct involute shape, machined by the Fellows gear-shaper generating method. The segment blanks



of each pitch are first turned in fixtures to conform to the full diameter in accordance with the number of teeth for the full circle. The gage is pocket size. *George Scherr Co. For more information, check No. 14 on the attached postcard.*

Dehumidifier

THE new dehumidifier, J-150, is a dual-absorbent automatic machine employing activated alumina as the drying agent. An adjustable cycle contained on the operating panel insures maximum operating efficiency under any weather or climatic condition both in the drying and reactivation process. This machine produces a continuous flow of air automatically and is suitable for special process rooms where it is necessary to maintain extremely low dewpoints. The dehumidifier has a removal capacity of 700 lb of water per day from air registering 90°F drybulb or 75°F wetbulb. Overall mea-

surements are 5x8½x7½ ft. The J-150 can be adapted to steam, gas or electricity for providing the reactivating heat. *Pittsburgh Lectrodryer Corp.* For more information, check No. 15 on the attached postcard.

Die Handling Truck

AN hydraulic elevating truck for handling large cumbersome dies has a capacity of 20,000 lb and



a top 60 x 80 in. Four hydraulic cylinders provide a 16-in. range of elevation from 26 in. in the lowered position. The powered pump has a ¾ hp motor that can be operated on a 110-v circuit. Synchronization of the four lifting cylinders is by a toggle lever arrangement with center guides to keep the table top level. Four 12-in. diam rear ball bearing wheels and four heavy duty 8-in. diam swivel casters provide portability under full load. The truck, when fully loaded, can be maneuvered by a walkie-type industrial tractor. *Lyon-Raymond Corp.* For more information, check No. 16 on the attached postcard.

Lifting Magnet

ALIGHTWEIGHT lifting magnet, weighing approximately 20 pct less than heavy-duty types, is available with 39 or 45 in. diam. Protecto-Weld construction places the weld on top of the magnet where it cannot be dented. Weight reduction is accomplished by using a thinner rolled steel outer ring instead of a steel casting. The new design cuts dead weight on cranes, particularly the lightweight mobile types. *Ohio Electric Mfg. Co.* For more information, check No. 17 on the attached postcard.

Explosion-Proof Heater

HAZARDOUS locations can be heated safely with an all-electric, explosion-proof heater that has been approved by the Underwriters' Laboratories, Inc. The heater incorporates a cast aluminum, natural convection, safety-grid, and a heating element of a

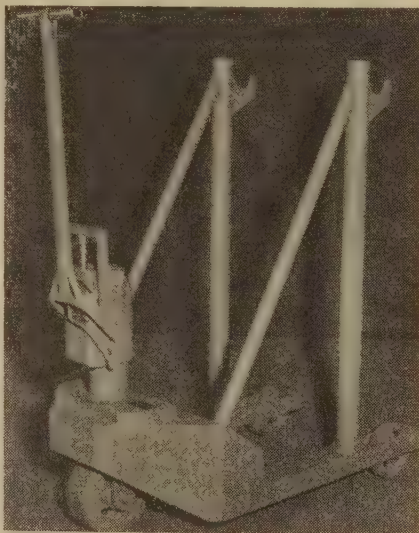
nickel-chromium resistor wire, insulated and sheathed in a seamless metal tubing that is embedded in a one-piece finned aluminum casting. The aluminum grid remains at a low operating temperature, but has high thermal conductivity. The heater provides complete or auxiliary heat and is available in three ratings of 2000, 4000 and 6000 w. *Electromode Corp.* For more information, check No. 18 on the attached postcard.

Acetylene Cylinders

ANEW line of acetylene cylinders have a monolithic filler that permits faster filling and more gas capacity. The cylinders are equipped with a top quality valve with either Prest-O-Lite type or commercial fittings. Caps can be furnished with cylinders when required. Bottom rings come as standard equipment on the four sizes, 39x12 in., 30x10 in., 30x18 in., and 24x6 in. All cylinders have five safety plugs and are manufactured to I.C.C. specifications. *Aetna Cylinders, Inc.* For more information, check No. 19 on the attached postcard.

Reel Carrier

LARGE reels can be handled with a special hydraulic lift truck that is built on the pattern of a single face pallet truck. Two

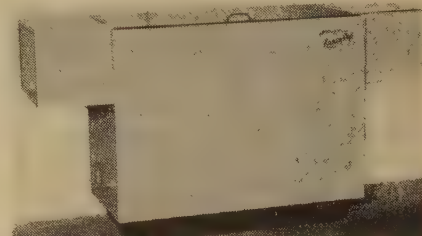


base forks have a center opening wide enough to straddle the reel to be lifted. Two uprights, welded to the base forks, have hooks that slip under the ends of a shaft passing through the reel hub. Elevating the truck 5 in. by the self-contained hydraulic pumping unit lifts the

reel so that it can be transported. The operator has control of the load at all times. *Lyon Raymond Corp.* For more information, check No. 20 on the attached postcard.

Cold Parts Cleaning Machine

THE Krazy Dip Senior cleaning machine is used in metal working plants for removing cutting oil and chips, buffing compounds, smut,



abrasives or other deposits on parts. Parts are handled in batches up to 350 lb in each cleaning operation. The machine is air powered. Mechanical agitation moves the parts in the cleaning solution 160 times per min. This agitation plus the chemical action of the cleaning solution scrubs the dirty deposits from all surfaces of the parts. *Magnus Chemical Co. Inc.* For more information, check No. 21 on the attached postcard.

Hand Pump

THE new Utility Master, a hand-operated barrel-type pump with a capacity of 10 gpm of light oil, gasoline, and kerosene, operates in either direction of rotation and can be mounted in any position. It is used for permanent installation in power shovels and for portable use with equipment for pumping from barrels and skid tanks. A foot valve, hose and nozzle, refueling spout for filling vessels without hose, and a combination-size bung adapter are accessories. The pump is a zinc die-casting with a stainless steel four-blade rotor shaft supported on two bearings. Inlet and outlet ports are 1-in. tapered pipe thread. *Romec Pump Co. Div. Lear, Inc.* For more information, check No. 22 on the attached postcard.

Revolving Apron Attachment

TURNING over or dumping lift truck loads by an hydraulic mechanism is possible with a revolving apron attachment for the Hyster 20 and 40 lift trucks. A revolving head or turntable, on which conventional fork arms are mount-

ed, turns 180° clockwise or counter clockwise. Capacity loads of 1725 lb with the 2000-lb capacity truck and 3650 lb with the 4000-lb capacity truck may be turned with the device. A feature of the revolving apron is that a special Load-Grab unit may be mounted on the turntable on the 20 lift truck in place of regular fork arms. Load capacity of the apron with the Load-Grab unit is 1400 lb. *Hyster Co. For more information, check No. 23 on the attached postcard.*

Small Tools

HEAVY duty flanged nuts in a range of sizes from 5/16 to 1 in. eliminate the use of loose washers. They are heat treated for wear. Stud sets are made in two additional sizes, one for 3/8-in. T-slotted machines with 5/16 in. studs and one for 1 1/16 in. T-slotted machines equipped with 1-in. studs. Step blocks graduated in 1/16-in. steps are 2 in. thick and have a range from 3 1/2 to 9 in. These blocks are interchangeable with other blocks made by the company and are available in cyanided steel or hard maple. *Northwestern Tool & Engineering Company. For more information, check No. 24 on the attached postcard.*

Color Filling Machine

A NEW hand-operated machine places color enamel filling into stamped, embossed, molded, cast and diecast parts and products. The design may be flat, curved, concave or convex. The enamel is carried from a platen shaped to match the surface being filled by means of a molded synthetic rubber die that is molded in a metal die to match the design. The depth of application is adjustable. *Acromark Co. For more information, check No. 25 on the attached postcard.*

Diamond Dressing Tool

A NEW universal diamond dressing tool is designed for rough and finish dressing or truing on surface, cylindrical, or centerless grinders. It will perform on bond hardnesses of aluminum oxide or silicon carbide grinding wheels. The dresser has numerous small solid diamonds evenly distributed throughout a special Colmonoy wear resistant matrix and these small diamonds produce a sharp cutting edge due to their small cross section. The tool does

not require resetting and can be used up completely without removal from the grinder. *Diamonds & Tools, Inc. For more information, check No. 26 on the attached postcard.*

Electrical Multi-Outlet Strips

SIX standard electrical outlets mounted in a metal casing 39 in. long are provided by the Multi-Outlet strip. They are spaced 6 in. apart from center to center and accept standard double prong plugs. A rubber covered cord and plug connects to the permanent outlet. The strip may be mounted on walls, side of a table, or laid flat. *Eberbach & Son Co. For more information, check No. 27 on the attached postcard.*

Core Binder

A NEW synthetic resin, Cycor 151, for binding of sand cores is a thermosetting resin that is water resistant and contains no filler or additives. The foundry may vary the amount of the binder and/or additives to obtain cores with green and baked tensiles, permeability, hardness and collapsibility necessary for the type

casting to be made. Cycor 151 produces water resistant cores that withstand high humidity and long lay-overs in molds. Cores can be cured in conventional or dielectric ovens and the binder allows quick-cured cores for rush jobs. *American Cyanamid Co. For more information, check No. 28 on the attached postcard.*

Cleaning-Pickling Acid

A COMBINATION of phosphoric acid, acid salts, surface active agents and inhibitors comprises a new corrosion control cleaning and pickling acid for ferrous metal. It is a concentrate to be diluted with water in proportion of one part acid to three parts water, and does not give off harmful fumes in cold or hot solutions. Metal cleaned and pickled in this C Acid is not attacked by the acid, it is reported. The acid is free-rinsing so that all trace is removed in the contact with clean water. It is said to produce an excellent surface for painting, plating, hot-dip galvanizing and vitreous enameling. *Nielco Laboratories. For more information, check No. 29 on the attached postcard.*

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1

Information Free . . .

DUST AND SPARK SUPPRESSOR, designed to control sparks, flames, smoke, fly ash, coke breeze, cinders, etc., from foundry cupolas, is described in bulletin. When used with a stack gas oxidizer and gas firing unit, also described, smoke control to meet the most rigid ordinances is effected. *Whiting Corp.* For more information, check No. 30 on the postcard.

BLOW TUBES, made of a plastic material said to last 10 to 20 times as long as metal, are discussed in bulletin. The plastic is also used for wear inserts and wear strips in core boxes, blow plates and similar applications. It is oil, acid and alkali-resistant. *Eastern Clay Products, Inc.* For more information, check No. 31 on the postcard.

SOLENOID VALVES—2, 3 and 4-way types—for hydraulic control equipment are discussed in bulletin 48-27. Maximum operation pressure is 2000 psi. Valves are available for piping sizes from 1/8 to 1 1/4 in., and are arranged for either gasket or subplate mounting. *Vickers Inc., Div. of Sperry Corp.* For more information, check No. 32 on the postcard.

COLD ROLL-FORMING brochure illustrates the equipment and process of cold roll-forming, the end uses of its products and the advantages and commercial possibilities involved. Auxiliary equipment for curving, coiling, ring forming, notching and other operations is discussed. *Yoder Co.* For more information, check No. 33 on the postcard.

SPECIAL PURPOSE FILES and their uses in specific jobs are covered in bulletin 137. Use of the files for aluminum, babbitt, brass, bronze, copper, magnesium, diecastings, cast and malleable iron, mild steels, annealed tool steels, stainless, plastics, and in diemaking, lathe filing and precision work is dealt with. *Nicholson File Co.* For more information, check No. 34 on the postcard.

PLAIN HYDRAULIC GRINDERS catalog A-49 gives information on a 4-in. type machine for cylindrical workpieces. Grinding cycles can be changed quickly. For production work, the maximum work diameter recommended is 1 1/2 in. *Landis Tool Co.* For more information, check No. 35 on the postcard.

SPECIALTY STEELS, including stainless and tool and die steels, are discussed in booklet. Analyses and properties are covered, and information is given on cast-to-shape steels of air hardening, oil hardening, flame hardening, hot work, stainless and heat resisting analyses. *Jessop Steel Co.* For more information, check No. 36 on the postcard.

LOW PRESSURE CYLINDERS information is given in 20-page catalog 236. Dimensional drawings, construction features and capacities of standard sizes are given, and information on mounting brackets, cylinder cushions, cylinder selection data, etc., is included. *Hanna Engineering Works.* For more information, check No. 37 on the postcard.

BAR BENDER for cold-forming is discussed in booklet. Twists as well as straitaway bends can be made. Short offsets and zee bends, from 1/32 in. up to 3/8 in. from start to finish of bend, are also possible. *Winfield R. Scott.* For more information, check No. 38 on the postcard.

CLAD ALL-METAL GASKETS, to prevent either liquid or gas leakage in seals, are described in bulletin. The gaskets have a copper base, for strength, covered by lead to provide sealing characteristics. Such gaskets are reusable and, due to the extremely thin cladding used, do not extrude. *Lead Alloy Products Co.* For more information, check No. 39 on the postcard.

WELDING FITTINGS catalog tabulates the specifications of a variety of fittings for pipe sizes up to 30 in. OD. Production of the fittings from seamless steel tubes is reviewed. *Globe Steel Tubes Co.* For more information, check No. 40 on the postcard.

FORGING production methods, and characteristics and types of forgings are described in 45-page booklet. Drop, smith, machine, press and turbine forgings are discussed and the advantages of forged pieces are reviewed. Design and tooling considerations and the metals used are covered. *Steel Improvement & Forge Co.* For more information, check No. 41 on the postcard.

STORAGE BATTERY HANDBOOK discusses the care and operation, maintenance and repairs, and parts required for motive-power batteries. Technical data are provided. Advice is given on acid mixing, on the use of hydrometers and on other related subjects. *Gould Storage Battery Corp.* For more information, check No. 42 on the postcard.

SPEED REDUCERS are described in 44-page bulletin 449. Directions for selecting speed reducers of the hp and speed required are given, and operation and maintenance of power transmission units is discussed. Very complete data and specifications, largely in tabular form, are provided. *Farrel-Birmingham Co., Inc.* For more information, check No. 43 on the postcard.

TRACER LATHE suitable for both first and second operation work is described in booklet 1804. Multiple diameters, tapers, faces, radii and chamfers can be turned accurately in a continuous cut by the cutting tool under tracer control. Setup time usually runs 10 to 15 sec. Savings achieved are cited. *Monarch Machine Tool Co.* For more information, check No. 44 on the postcard.

ELECTRIC HOISTS with 500, 1000 and 2000-lb capacities are described in bulletin H-100A. Hoisting speeds range up to 30 fpm. Light weight, headroom savings, extended chain life and other features are stressed. I-beam trolleys for the hoists are also covered. *Whiting Corp.* For more information, check No. 45 on the postcard.

THE IRON AGE, New York 17, N. Y.

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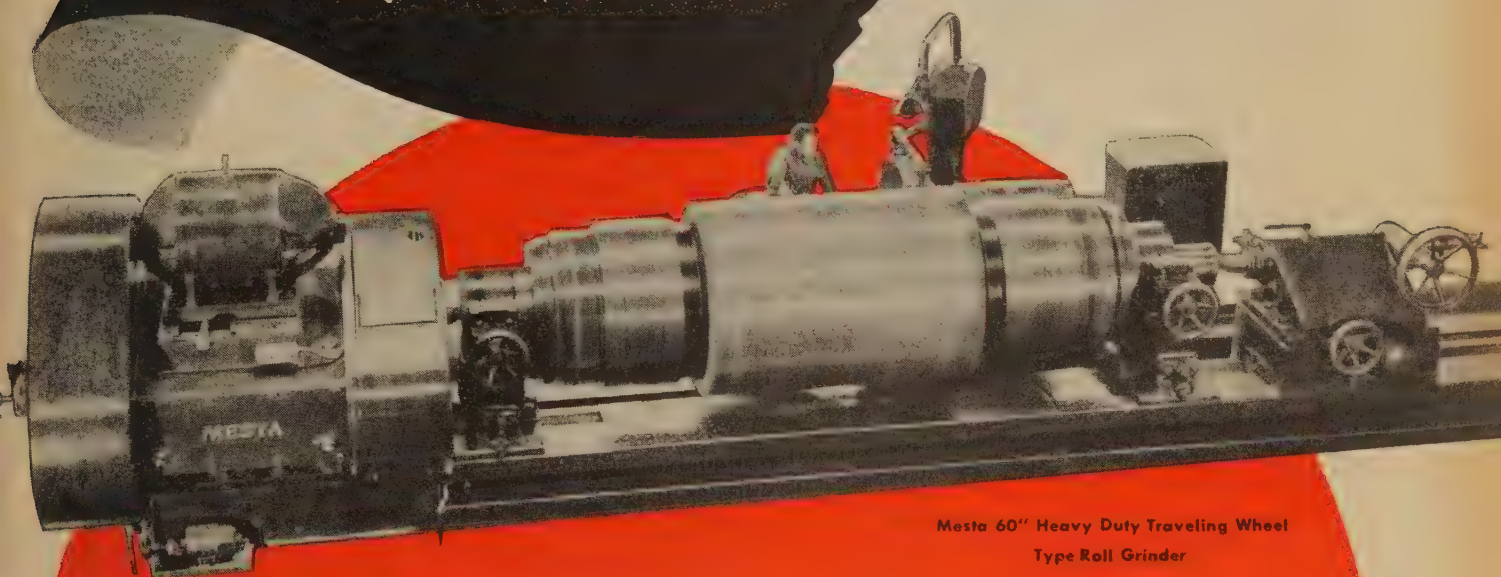
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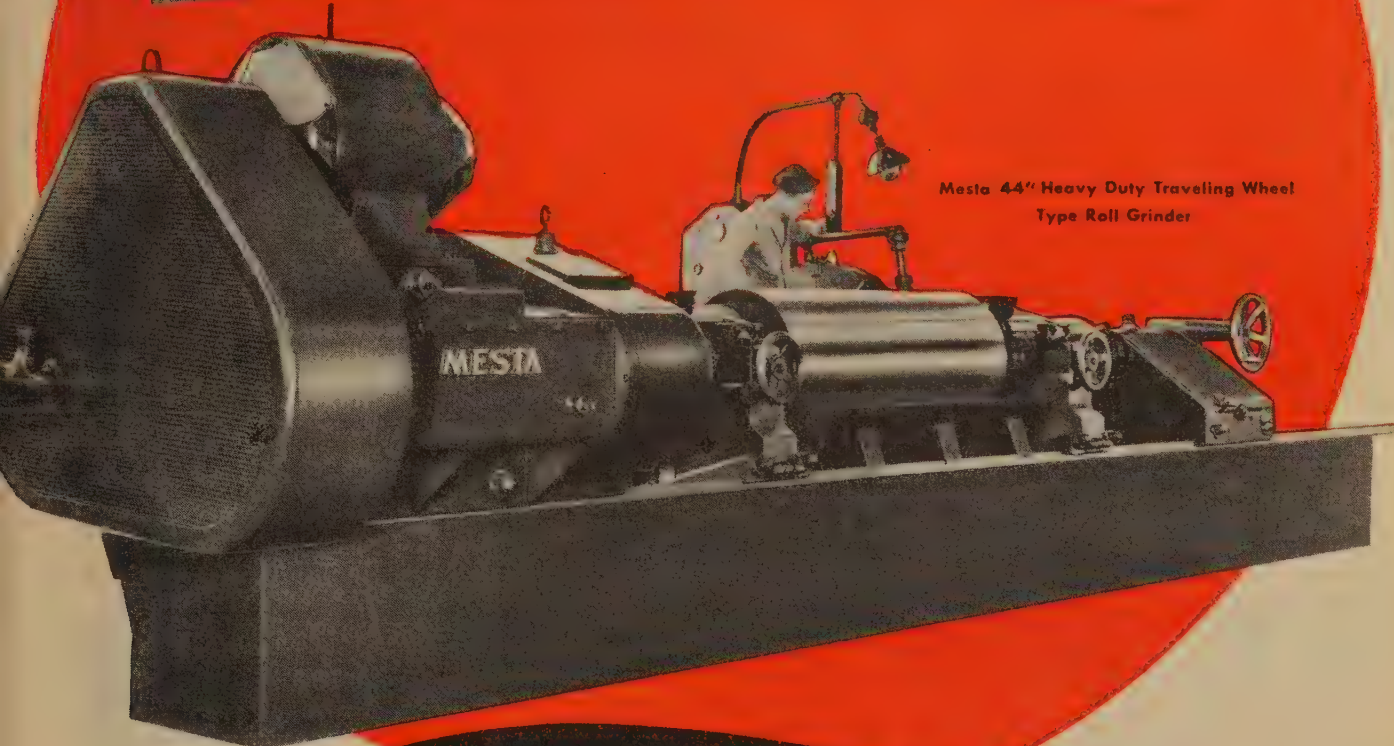
MESTA

Roll Grinders

Mesta Roll Grinders of simplified design are the most accurate and dependable grinding machines available today. Built with precision for the finest finishing and with ruggedness for the heaviest roughing.



Mesta 60" Heavy Duty Traveling Wheel
Type Roll Grinder



Mesta 44" Heavy Duty Traveling Wheel
Type Roll Grinder

Designers and Builders of Complete Steel Plants
MESTA MACHINE CO., PITTSBURGH, PA.

• Auto production hits new postwar peak . . . GM opens its Detroit exhibit . . . Bricker takes inactive role at Ford . . . War veteran plans to live for 14 months in a K-F car.



DETROIT — A prediction by the Automobile Manufacturers Assn. that March output would reach a 20-year high appears to be justified. The estimated number of cars and trucks assembled in U. S. plants during March has been placed as high as 520,000 by some sources. The March 1948 total was 492,034. The figure for March 1941 was 510,122.

The March figures for this year lag somewhat behind March 1929 when 585,455 units were assembled in U. S. plants. The possibility that 1949 automobile output will surpass the 1929 total rests on the fact that the last half of 1929 fell considerably behind the first two quarters of that year.

Thus far during April output has lagged a little behind expectations, primarily because of the strikes at Midland which supplies frames for Chrysler. Ward's estimate of U. S. and Canadian production for the week ended Apr. 8th, however, is 130,197 cars and trucks, a new postwar high, compared with 119,088 units a week ago and 103,004 for the corresponding week of 1948.

Automobile production schedules are in sharp contrast to the glib talk heard today about a faltering U. S. economy. Rightly or wrongly, Detroit auto executives are apparently counting heavily on such market factors as: 13 million cars 10 years of age and over; an average age of U. S. cars 8.8 years compared with 5.5 years in 1941; a scrappage rate that is about half the prewar rate; and a dispensable U. S. income that is up \$107 billion or 116 pct above the 1941 level.

Passenger car production has been climbing steadily since January. The projected rate of sales for the next few weeks is at an even higher tempo. Reliable sources indicate that car stocks are still less than the number the industry says is normal. Reports of sales of cars by dealers during March and early April have thus far fully justified the industry's optimism about its market, according to informed sources.

An interesting aspect of the situation to watch will be the effect of recent price reductions on future sales of new cars. Will the cuts in auto price tags be the signal for prospective purchasers to withdraw from the market and wait for a still lower price? Or will this be the signal for car dealers really to get out and sell cars? The automobile industry is making its greatest effort during the first postwar period to move used cars in dealer's hands. Service opportunities are also being stressed to bulwark the dealers in the event that the market for new cars tends to contract. Some car producers are campaigning to move all used cars in dealer's hands within a 30-day period.

The optimism of Detroit's automakers is today being measured against a growing volume of pessimism by the so-called crystal ball gazers and the "man in the street." If the auto industry turns out to be correct about its market estimates, it will have earned the thanks of a

great many people who are today frankly skeptical of the soundness of today's market for new passenger cars and trucks.

* * *

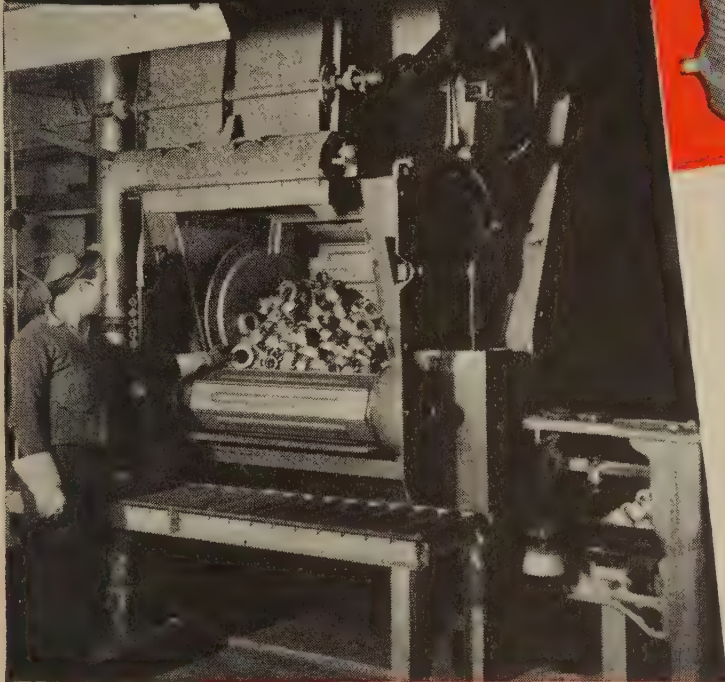
ACT II of General Motors' great extravaganza, "Transportation Unlimited," opened at Convention Hall this week to an eager crowd of half a million Detroiters. The Detroit Show is essentially the Waldorf Show which has been supplemented and transplanted to the home grounds. In the transplanting, a number of exhibits have been added which are obviously destined to catch the fancy of Detroit's auto-conscious public. The original New York Show was described in an earlier issue of THE IRON AGE, (Jan. 27, 1949, p 86). Incidentally, the Detroit show required 127,704 sq ft compared with 26,250 sq ft used in New York.

GM's "Try It Yourself" exhibit continues to be a source of endless fascination to visitors at the show. Included among the push-button exhibits at Detroit are a miniature model auto chassis that absorbs and records simulated road shocks; an Allison jet aircraft engine model that demonstrates how it gets its thrust; a hydraulic booster that supplies up to 40,000 in-lb of torque to assist in the steering of trucks, buses and other vehicles. Also shown is a new "recirculating ball, nut and screw" bumper jack. By manipulating the jack the visitor is able to lift his own weight. The weight is recorded on a fortune teller's card which is turned over to the visitor as a souvenir.

The corporation didn't forget the frustrated railroad engineers among its visitors either. There is a full size GM diesel cab complete with instruments where the guest steps in and "plays" engineer.

Other exhibits, some of which have been added to appreciably since the New York show, include a "tandem twin" Diesel assembly and mechanical, hydraulic and electrical

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performance at
ELKHART BRASS MFG. CO.
returned investment in 27 months

Cleans brass, bronze and aluminum castings for fire protection equipment weighing from 1 oz. to 50 lbs. each.

FORMER METHOD

Equipment

- 1 Airblast Barrel
- 2 Wet Tumblers

Production

4 tons in 8 hours

Labor

16 man hours

Cleaning Costs

Daily \$14.92
Per Ton \$3.73

WHEELABRATOR METHOD

Equipment

27" x 36" Wheelabrator Tumblast
(5 cu. ft. capacity)

Production

5½ tons in 4 hours

Labor

4 man hours

Cleaning Costs

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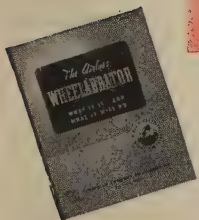
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devices used to test for balancing, power, fatigue and stress.

Bricker Steps Aside

Detroit

• • • Another of the automobile industry's ace production men has stepped aside. Ford Motor Co. has announced that M. L. Bricker, has relinquished his duties as general production head of the company. In the future Mr. Bricker will act as consultant for Ford. He will continue as a director and as a vice-president and member of the policy committee.

Mr. Bricker first went to work for Ford as a machinist in 1904. Later, he left the company but returned in 1914. Under Bricker's guidance Ford Motor Co. hit an all-time production peak. During the 1920's the Rouge plant was turning out the necessary parts for 9000 cars per day. During World War II, he was general manager of Ford's Willow Run plant and was in charge of that plant from the beginning. It will be recalled that under Bricker, Willow Run was able to turn out one B-24 bomber per hour.

A gigantic reshuffling is going on in the Ford organization. The company has thus far set up six separate divisions: The Ford Div.; Rouge Div.; Lincoln-Mercury Div.; Parts & Equipment Mfg. Div.; (covering the small plants) General Mfg. Div. (which replaces the former Machining & Forging Div.); and the Ford International Div.

Logan C. Miller has been named general manager of the newly or-

ganized Rouge Div. This division constitutes the major part of the former General Production Div. which was headed by Bricker.

Mr. Miller joined Ford in 1914 as a diemaker. Later he was appointed superintendent of the motor building at the Rouge plant. For the past three years he has been general manager of the Rouge Automotive Mfg. Operations. Ray H. Sullivan will head the automotive manufacturing operations which now comprises all automotive manufacturing units at the Rouge plant. Sullivan was formerly vice-president in charge of manufacturing for E. W. Bliss Co.

The newly organized Rouge division includes, besides automotive manufacturing operations, the steel operations, blast furnaces and coke ovens, the power department and manufacturing services.

Ford manufacturing operations outside the Rouge will be directed by John Dykstra, general manager of Ford's General Mfg. Div. Dykstra's responsibilities include the former Machining and Forging Div. in Highland Park and elsewhere, and covers operations at Mound Road and Canton, Ohio, forging plants.

Veteran Starts Unique Trip

Detroit

• • • Considerable time has elapsed since the auto industry has dreamed up a top-notch press agent stunt. This record, however, is about to be broken it appears.

Don Haynes, a former Merchant

Marine, is about to embark on a 14-month tour locked inside a barred and sealed 1949 Kaiser. The car is equipped with everything but a usable exit. It has a bed and a chemical lavatory. It has a collapsible bath tub and, presumably, shades to be lowered at opportune moments. It has mechanical exercisers. There is even a hole in the floor where Mr. Haynes can practice stretching his legs. The car is equipped, of course, with a refrigerator, cooking stove and electric shaver.

Haynes' reward? Oh yes—\$25,000 plus a \$1000 side bet by a doubtful friend.

The auto marathon started Feb. 19, according to Kaiser-Frazer, from Ashland, Ore. Haynes has been visiting many of the capitols on the West Coast. Early this month he returned to Ashland to be present when a second child is expected to arrive in the family. Later on he plans to visit, among other places, the Kentucky Derby, the Indianapolis auto races, and the Rose Bowl at Pasadena. When does he get his release and the \$25,000? Apr. 19, 1950.

Noise Research Pays Off

Detroit

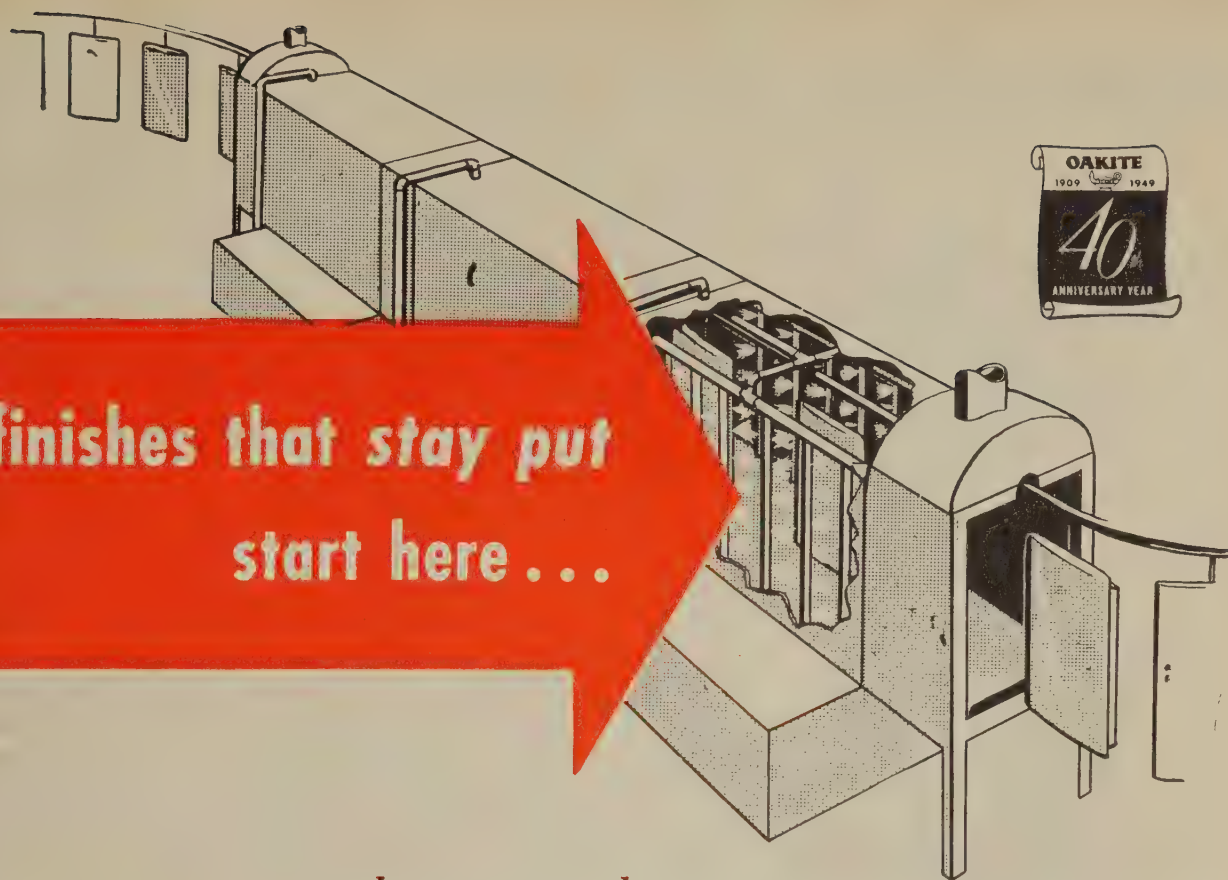
• • • For the past several years General Motors technicians have been devising an increasing number of devices to detect noise under all driving conditions. The research appears to be paying off.

One result of the testing is seen in the changes made in the 1949 model cars. Take the Pontiac, for example. The fan pitch and the speed have both been lowered in order to reduce engine whine. In addition, the engine silencer has been made more effective in quieting the air induction system. Before entering the carburetor all air drawn into the engine passes through four silencing chambers. The first of these is the so-called "hiss" chamber. This has been made more effective by the use of a coat of neoprene on the silencer ceiling.

As Pontiac engineers explain, practically simultaneously, the vibrating air column enters the high, intermediate and low note tuning chambers which neutralize the sound vibrations. Even the untrained layman can quickly detect the marked improvement, particularly at high speeds, they say.



NEW HEAD: James Boyd (right) being sworn in as Director of the Bureau of Mines, by Chief Clerk Floyd Dotson (left), as Secretary of the Interior J. A. Krug looks on. Serving under a series of recess appointments since August, 1947, and without salary since December, 1947, Dr. Boyd also received back-pay checks totaling \$12,600 following his confirmation on Mar. 22 by the U.-S. Senate.



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• Heavy water usage causing concern . . .
Government urges conservation measures . . .
Pollution control important part of program.



WASHINGTON — Shortages of raw materials are nothing new to many of the nation's basic industries. The likelihood of a shortage of water, however, is something that has been given little attention except by specialists in this field. While the North American continent is the best watered on the earth, as to both quantity and distribution, a tremendous increase in water usage for municipal, industrial, and irrigation purposes in recent years has set government experts, particularly in the Interior Dept., to thinking about conservation of this prime natural resource.

In addition to increased usage the steadily increasing pollution of the nation's water supply, a natural corollary to steady economic growth, has cut into the supply to a substantial degree. Congress recognized the importance of abating pollution last year when it passed the first federal law relating to the problem, after kicking it around since the turn of the century.

Water demand in a modern civilization is almost insatiable and Interior Dept. experts estimate that many areas have reached the limits of readily available supply. In little more than a decade (1936-46) the pumping from underground sources alone in the United States has increased from about 10 billion to over 20 billion gal per day. While the total pumpage at present is not known, it is quite certain that it has increased substantially since 1946. Comparable data on the use of surface water is not available but the Interior Dept. is reasonably certain that the increase is of similar or perhaps greater proportions.

MUNICIPAL pumping for water supplies represents one of the chief causes of the heavy drain in recent years. The increase in industrial usage, particularly in the East, also ranks high. A more recent use which cannot be gaged accurately, but is very important, is for air-cooling systems. In all major cities there is a constant demand for increased quantities of underground water because of the uniformity of temperature. Irrigation is also an important factor and while it is not believed that this use has a serious effect on the supply itself it does tend to overdevelop the actual supply.

This heavy usage of water makes doubly important the maintenance of long continued records of stream flow and ground water. For this reason the Congress is expected to approve an increased appropriation for the cooperative work of the Interior Dept. relating to the gaging of streams and investigation of water supplies. The Interior Dept. estimates that adequate ground water investigations have been made for not more than 5 pct of the total area of the country. About 25 pct has been covered by reconnaissance methods and there are large areas on which no investigation has been made, particularly directed toward underground water resources.

Interior officials claim that knowledge of the reliability of our water supply is vital to national security from both a military and industrial aspect. They point out that if the heavy consumption of water related to the war effort had occurred in a period of drought like that widely prevailing in the early 30's, it could have very seriously impaired production schedules. Adequate knowledge of underground water resources is particularly important since ground water provides the normal stream flow that prevails during dry periods. Hence, heavy draft on ground water reservoirs reduces the quantity of water in interstate streams during dry periods.

THROUGHOUT Washington, including the Congress, there is a growing awareness of the fact that water, particularly underground water, is a critically limited resource. Congressional interest in the water problem was directly manifested last year when the 80th Congress enacted a law (Public Law No. 845) which authorized a Federal-State-municipal program, looking toward the abatement of stream pollution.

Authorizing Federal cooperation with states and municipalities on research and engineering studies and loans for the construction of facilities to treat industrial and domestic wastes, the law is expected to cost industry hundreds of millions of dollars, since the Federal government can file suit against industrial non-cooperators.

The 5-year program is viewed as a broad plan for total use of our water resources. While plans for the first year of operation have been prepared by the Public Health Service and the Federal Works Agency they will not get underway until July 1, provided Congress appropriates the money authorized in P.L. 845.

This law authorized the appropriation of \$135 million, in annual sums not to exceed \$27 million



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for each of five fiscal years, beginning July 1, 1949. Of this amount, \$22.5 million is set aside for loans by the Federal Works Agency to municipalities for the construction of remedial works which have been approved by the states and the PHS. The remainder is for grants to states for study and research and engineering and planning. The loans are limited to 1/3 of total cost and call for 2 pct interest.

AS soon as funds are available, the PHS will begin work in each of the 14 drainage areas in the country. The PHS program has three major objectives: (1) co-operative development of programs for abatement of pollution; (2) research into the causes, means of prevention and treatment of pollution; and, (3) construction of remedial works.

PHS officials state that there is now sufficient knowledge and equipment to deal with 60 pct of polluting wastes, and practically all organic wastes. Therefore, research will be concentrated on those wastes for which practical treatment is not

known. Another important aspect of the research program will be directed to the reclamation of industrial by-product wastes.

The 5-year program is just a start, however, according to PHS. It is claimed that \$3 billion to \$5 billion will be necessary to build facilities for treatment of industrial and domestic wastes. FWA estimates that some 80,000 miles of new sewer lines are needed throughout the country, as well as 12,000 new treatment plants. Necessary sewage works in New York alone will cost more than \$1 billion, while California, Illinois, Michigan, Missouri, New Jersey, Ohio, and Pennsylvania each requires sewage works that will cost \$100 million.

Most recent Congressional recognition of the problems raised by stream pollution is contained in companion bills (S 1118-HR 1342) introduced by Senator Wiley, R. Wis., and Representative Brynes, R., Wis., which would allow the amounts paid for plants for the treatment of industrial wastes as a deduction in computing net income for tax purposes. This legislation has little chance of enactment dur-

ing the present session, but as the costs of treating industrial wastes begin to rise during the 5 year program more serious attention will be given to such proposals.

ECA Approves Foreign Firms' Modernization And Plant Expansion

Washington

• • • A quarter-billion dollar expansion and modernization program for the British, French and Austrian steel industries was approved this week by the Economic Cooperation Administration which will put up about a quarter of the needed funds.

Largest project involved is a \$240 million modernization of Welsh facilities under direction of the new Steel Co. of Wales, Ltd., representing the larger steel interests. Work has already started on a completely integrated plant near Port Talbot, Glamorgan. It will include blast and openhearth furnaces, slabbing, hot strip, tinplate and sheet mills.

In Austria, ECA will assist in getting construction started on a slabbing and blooming mill as well as a hot strip mill at Linz, Austria. Also approved were two mills in France—a hot strip at Denain and a cold strip mill at Montataire near Paris.

In addition, ECA has authorized \$825,000 for special equipment for each of two new aluminum foil plants in France, one at Rugles and the other at Froges.

A long-range total of about \$50 million in ECA funds is involved of which some \$29 million will be obligated before June 30. Both the World Bank and the Export-Import Bank will have a hand in helping finance the remainder of the \$260 million involved.

The Austrian rolling mill construction is being done by the Mesta Machine Co. with Westinghouse as a subcontractor, ECA said. Continental Foundry & Machine Co. will provide other equipment.

Nine U. S. firms will provide equipment for the French aluminum foil projects. All of ECA authorizations, including the \$27 million for the Welsh project, will be spent for American-made equipment.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



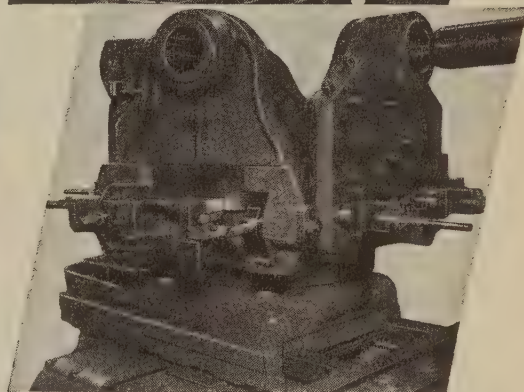
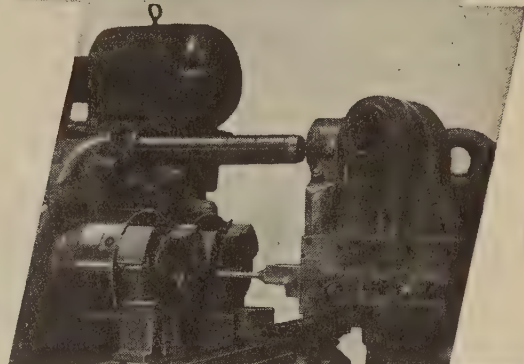
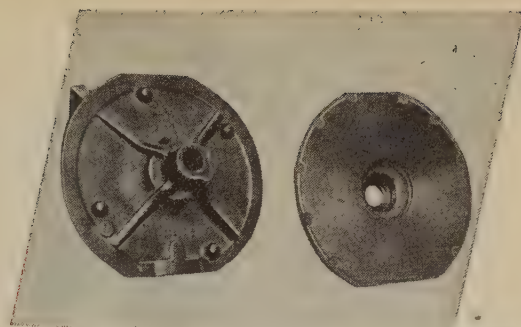
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- 3rd TF** — Finish bore three diameters. Form bevel. Machine 3.009" diameter.
- 4th TF** — Finish face front side. Machine groove in bore.
- 5th TF** — Ream three diameters.

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**AUTOMATIC
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• Smog ceases to be joke to industrialists spending millions of dollars to control waste gases . . . Kaiser furnace not to be closed.



SAN FRANCISCO—Apparently even the wide open spaces of the Far West are neither wide enough nor open enough to absorb or dissipate the smoke and fumes and other wastes generated by the increasing number of industries which are changing the western economy.

Smog—that combination of smoke, fumes and fog (pardon the word) which obscures the sun, reduces visibility and often irritates the eyes of residents and tourists alike who come west in search of the highly famed salubrious climate—is no joking matter for industrialists faced with heavy expenditures in an attempt to eliminate this nuisance.

In the Los Angeles area where industrial growth and expansion has been most rapid, the situation is the most acute. There the County Air Pollution Control District has been formed under the State Air Pollution Control Act headed by Louis C. McCabe who reports that 289 industries in that area have already authorized expenditures in excess of \$4½ million for equipment to attempt to eliminate causes of this nuisance.

Bethlehem Pacific Coast Steel Corp. whose openhearth is lo-

cated only about 5 miles from downtown areas of Los Angeles, has installed a pilot plant in one stack which passes hot gases and smoke through a venturi tube where a low pressure water spray wets the smoke particles which are then captured in a separate tank. So far experience has not proved whether a full sized application of this type of cleaner would meet the requirements of the antismog laws.

Columbia Steel Co. with its openhearth at Torrance is also faced with the problem of controlling fumes and smoke from its furnaces, and is conducting similar experiments.

A serious obstacle to use of control equipment utilizing large volumes of water is the scarcity of that fluid in the semi-arid south. Some hope is held for the efficiency of electrical precipitators, and even high frequency sound waves, inaudible to human beings, have been suggested. It is reported that this method has been used successfully to collect fine particles of sulfuric acid in a manufacturing plant. Foundries of all types have been looked upon with a jaundiced eye by the smog control authorities and since there are approximately 185 of these plants in Los Angeles County they too are being carefully surveyed. American Brass & Aluminum Foundry now has in operation a \$9000 piece of equipment at Los Angeles which indicates considerable promise in fume control. According to Tony Oropallo, the unit is expected to collect about 1500 lb of zinc oxide a week which has a commercial value.

THE approximately 75 gray iron foundries in Los Angeles County are also faced with the necessity for control and three types of pilot plants are now in use to determine the most efficient methods. Steel foundries numbering about 20 in the area are likewise conducting experiments to meet the legal requirements.

The petroleum industry has

long been suspected of contributing to the fumes which cause eye irritation, and refineries are expected to have to complete control measures which may run into hundreds of thousands of dollars.

Action is also being taken against open dumps burning rubbish, lumber companies who must dispose of sawdust by burning and other industrial groups.

Under the regulations of the County Control District an owner of a plant must submit plans for proposed control equipment before installing it on the premises so that otherwise needless expenditures will not be made for ineffective equipment. No authoritative estimate has been made as to the overall cost to industry for control in the Los Angeles district alone, but some estimates run as high as \$75 million.

The Air Pollution Control Act of California is said to be the first legislation of its kind enacted in the country and has attracted nationwide attention from other communities.

The system of issuing permits went into effect in February of 1948 and approximately 350 permits for construction of control devices have been issued and reportedly complaints from residents have been decreasing since late last fall. Approximately 1500 inspections are made by representatives of the district each month and an average of 200 notices have been issued in the same period.

THE city of San Francisco brought the problem into the open with an appeal to the San Francisco Bay Area Council to undertake a study to determine what steps should be taken in that area to form a Bay Area pollution district. Because of the peculiar geographical location of the city of Los Angeles, which is surrounded largely by hills, that area is more susceptible to this annoyance than is San Francisco which is so frequently swept by ocean winds. However, San Francisco and Oakland city officials are con-

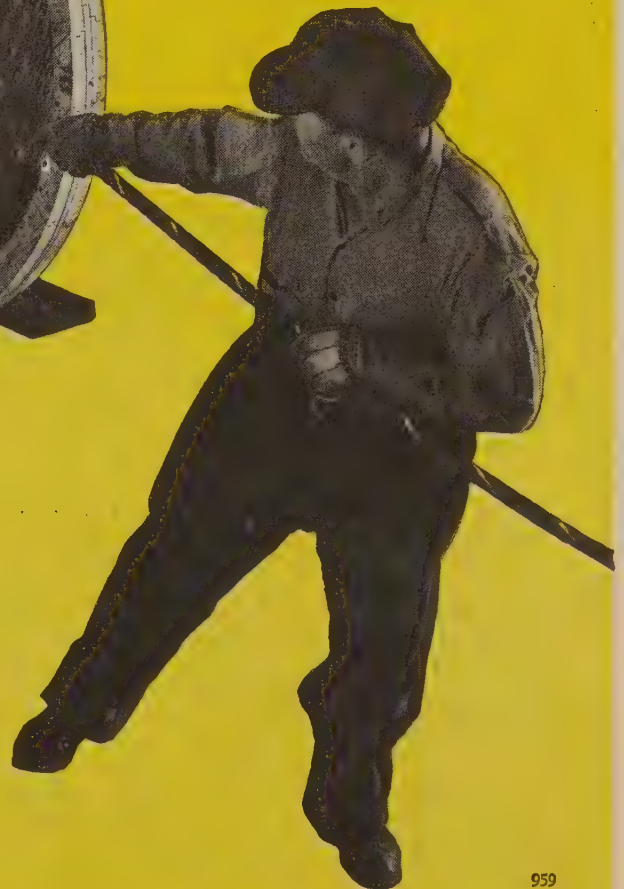
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sidering control measures as a precaution.

In the Pacific Northwest the aluminum industry already is in litigation through suits brought by farmers who contend that fluorine fumes were injuring and killing their livestock, crops and trees. A damage suit for \$900,000 has been filed against the Aluminum Co. of America at Vancouver, Wash. and a \$1.5 million suit is on file against the Reynolds Metals Co. by farmers who charge fluorine fumes from Reynolds' plants at Troutdale, Ore., and Longview, Wash. damaged crops and animals. Alcoa has already settled some claims for such damages and is now installing control equipment estimated to cost approximately \$1 million.

To aid western industry management attempting to eliminate or minimize industrial health hazards the U. S. Public Health Service is setting up its first industrial hygiene field station outside of Washington, D. C., near the the University of Utah campus in Salt Lake City. The plan is to develop the property as a medical center of the University of Utah Medical College.

The station's immediate assignment when it opens about June 1 will be to make available to state industrial hygiene agencies an analysis of the atmospheric contaminants of the various working environments in the West. Later its staff will be enlarged to include toxicologists, engineers, nurses and medical doctors who are specialists in industrial health.

HENRY N. DOYLE, industrial engineer, will be in charge of the new field station. Dr. Richard H. Young, dean of the medical college, says it is contemplated that the school and the field station will work closely together and that the station's facilities and personnel will be available to the school and vice versa.

Dr. H. L. Marshall, head of the medical school's department of public health and preventive medicine, said three locations were considered for the field station — California, Colorado and Utah.

The Utah site was selected because it is the geographical center of the area the station is designed to serve; and because a large de-

mand for research and advisory services is expected to come from the nonferrous metal mining and smelting industry and industries which locate around the Geneva steel plant or the copper refinery which Kennecott Copper Corp. is building.

In announcing the projected field station, Dr. Leonard A. Scheele, surgeon general of the public health service, said: "This marks another step forward in our attack on the 500 million man-days per year of absenteeism from sickness in this country. The West, with 30 pct of the nation's labor force, can do away with a great amount of that toll.

Works on Fog Dispersal

Los Angeles

• • • Led by Todd Shipyards and with engineering work by Byron Jackson Co., Babcock & Wilcox and various oil companies, commercial use of the results of experiments conducted in fog dispersal at Arcata, Calif., appears possible.

The "Fido" (fog, intense, dispersal of) system has been installed at Los Angeles Airport and there is consideration of its use to protect citrus groves from frost.

The system calls for installation of pipe lines equipped with burners, each with an atomizer nozzle about a foot above the ground at the edge of the airport or orange grove. Diesel fuel is pumped into the pipe line, the burners are lit, and a big fan blows the formed air through the area. In orange groves, vertical fans would be installed also at intervals to suck the rising warm air back to the ground.

Metal Plants Ranked First

Los Angeles

• • • Figures compiled by the Los Angeles Chamber of Commerce indicate that metal plants ranked first among new industrial units established in this area in 1948. More than \$3,723,000 was spent in opening new plants here and \$3,813,500 in expansion. Aviation spent \$1,910,000 in new buildings and \$2,133,000 in expansions. Figures for automotive industry were \$655,000 in new units and \$2,295,000 in expansion.

Complete First Tower On New Tacoma Bridge

Seattle

• • • The end of last week saw the first new tower of the rebuilt Tacoma Narrows Bridge being constructed by Bethlehem Pacific Coast Steel Corp. completed. At that time steelworkers went across the Narrows to the west shore to erect the second tower within the contract time ending June 16.

Wednesday the 13th and last tier was erected on one of the two legs of the east tower; and by Friday the two saddles were lifted to the top for placement. These saddles will accommodate the cables, spinning of which will start in the summer after the west tower is completed. The east shore anchorage is about ready now.

These saddles weigh 11½ tons each and were lifted 500 ft, which is the height of the tower above average water level. Erection time for the 2700-ton steel tower was 30 working days. Seventy-two tons of steel rivets, manufactured by Bethlehem Pacific's Seattle bolt and nut division, were used in the east tower.

The new bridge has a span of 2800 ft, the center and end spans together will total about 1 mile in length and will carry four traffic lanes. It will be the second longest suspension bridge on the Coast, exceeded only by the Golden Gate Bridge.

Operates Blast Furnace

Salt Lake City

• • • Although the Kaiser-Frazer Parts Corp. blast furnace at Iron-ton has been banked for 6 days and is now again in partial operation, Kaiser Co. Inc. officials operating this unit state that there is no intention of permanently closing this facility in the foreseeable future and that it will continue to be operated as demand for foundry and basic pig warrants.

E. J. Duffy, manager of the operation, has stated that the furnace was taken out of production for a short time to permit clean up work and repairs. According to him, the temporary shutdown will not materially affect the number of employees.

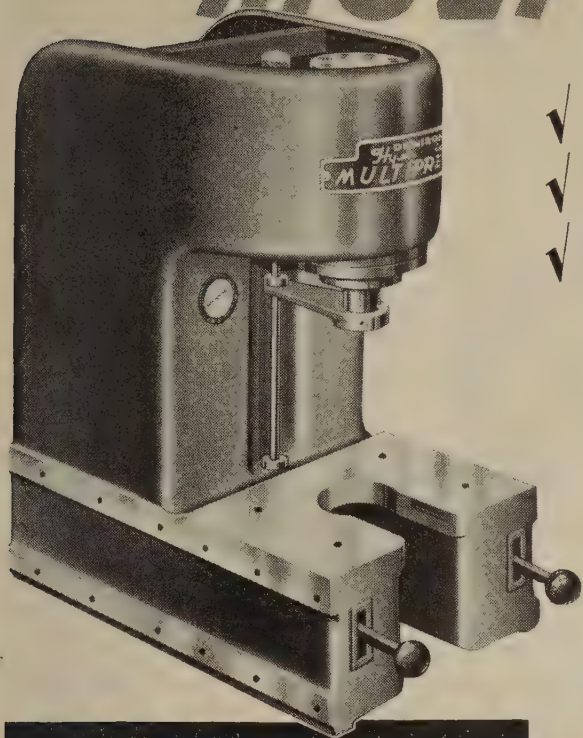
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Eliminating trapped air, improving metal flow conditions, eliminating laminating in parts formed of loose material, sharper detail on coined or embossed parts are only a few of the many advantages gained through use of Denison exclusive Vibratory HydroILic Pressure.

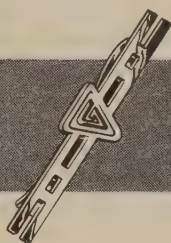
Tonnage is reduced considerably on many jobs. Tests have proved conclusively that when vibratory strokes are used not only is less pressure needed—sharper definition is obtained through better metal flow.

All this adds up to lower costs for your operation. This new principle may be the answer to any number of your production problems. Why not take advantage of our test lab facilities to check your job—with vibratory repeat strokes. Write for full information.

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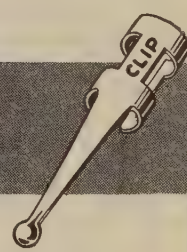
Initials are coined in tie clasps better and faster with vibratory strokes. Same press pierces and blanks clasps.



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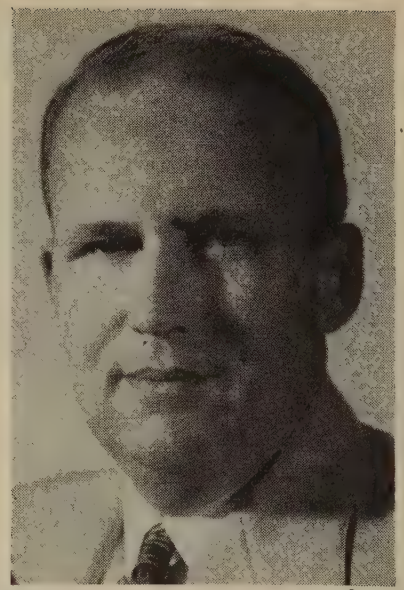
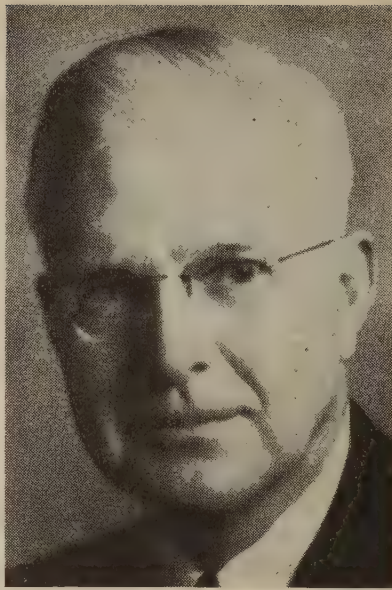
PERSONALS

• **Arthur B. Cooper** has been promoted to assistant to the vice-president in charge of operations, Jessop Steel Co., Washington, Pa. He had formerly served as general superintendent, to which vacancy **Edwin C. Thomas, Jr.**, has been named. Mr. Thomas had formerly been superintendent of the bar mill. **Benjamin H. Brown** has been reappointed superintendent of the electric furnace department, which position he held prior to 1948. Before Mr. Brown's reappointment, he had been engaged in consulting work. **Joseph W. Stier** has been appointed superintendent of scheduling. He had previously been associated with Crucible Steel Co. of America.

• **Frank A. Weiss** has been appointed assistant to the general manager, Hyatt Bearings Div., General Motors Corp., Harrison, N. J. Mr. Weiss has served 36 years in the company's purchasing department, first as an assistant and then as general purchasing agent. **Leo V. Farrell**, formerly assistant purchasing agent, has been promoted to general purchasing agent, succeeding Mr. Weiss in that position. Mr. Farrell joined the production department of Hyatt in 1922.

• **Earl W. Bennett** has been elected chairman of Dow Chemical Co., Midland, Mich. **Leland I. Doan** has been elected president, succeeding Willard H. Dow. Mr. Bennett had previously served as vice-president and treasurer and also chairman of the finance committee. Mr. Doan had been vice-president and secretary. **Dr. A. P. Beutel** and **Russell L. Curtis** were elected vice-presidents. **Dr. Mark Putnam** has been appointed general manager and a member of the executive committee. **Calvin A. Campbell** has been made secretary and **Carl A. Gerstacker**, treasurer.

• **Donald C. Potts** has been elected vice-president of operations, **R. C. Stanbrook**, vice-president, engineering, and **Harold L. Hale**, comptroller, Pittsburgh Steamship Co.,



LEW E. WALLACE (left), general manager of sales, and JAY W. OWINGS (right), assistant general manager of sales, Youngstown Sheet & Tube Co.

Cleveland, an ore-carrying subsidiary of U. S. Steel Corp. **Loran F. Hammett** has been appointed assistant to the vice-president in charge of operations. **A. S. Thaeler** has been named assistant to vice-president in charge of engineering and **David F. Barackman** has been made assistant to the comptroller. Mr. Potts has been with Pittsburgh Steamship since 1913 and previous to his new appointment had served as assistant to the president. Mr. Stanbrook joined the company as marine engineer in 1944. Mr. Hale has been with the company since 1939 when he joined the accounting division and since 1943 has served as assistant auditor of the company. Mr. Hammett has been associated with Pittsburgh Steamship since 1938 and in 1948 was made assistant to the president. Mr. Thaeler has been connected with the company since 1948 as assistant marine engineer. Mr. Barackman joined the company in 1948 as an accountant.

• **John E. Ellas**, who has been a salesman in the Detroit branch office of Berger Mfg. Div., Republic Steel Corp., Cleveland, has been promoted to manager of the Kansas City branch office of Berger. **Richard E. Lautenzenheiser**, who recently joined the Berger organization, succeeds Mr. Ellas in Detroit.

• **John J. Powers, Jr.**, secretary of Chas. Pfizer & Co., Inc., New York, has been elected a director of the company.

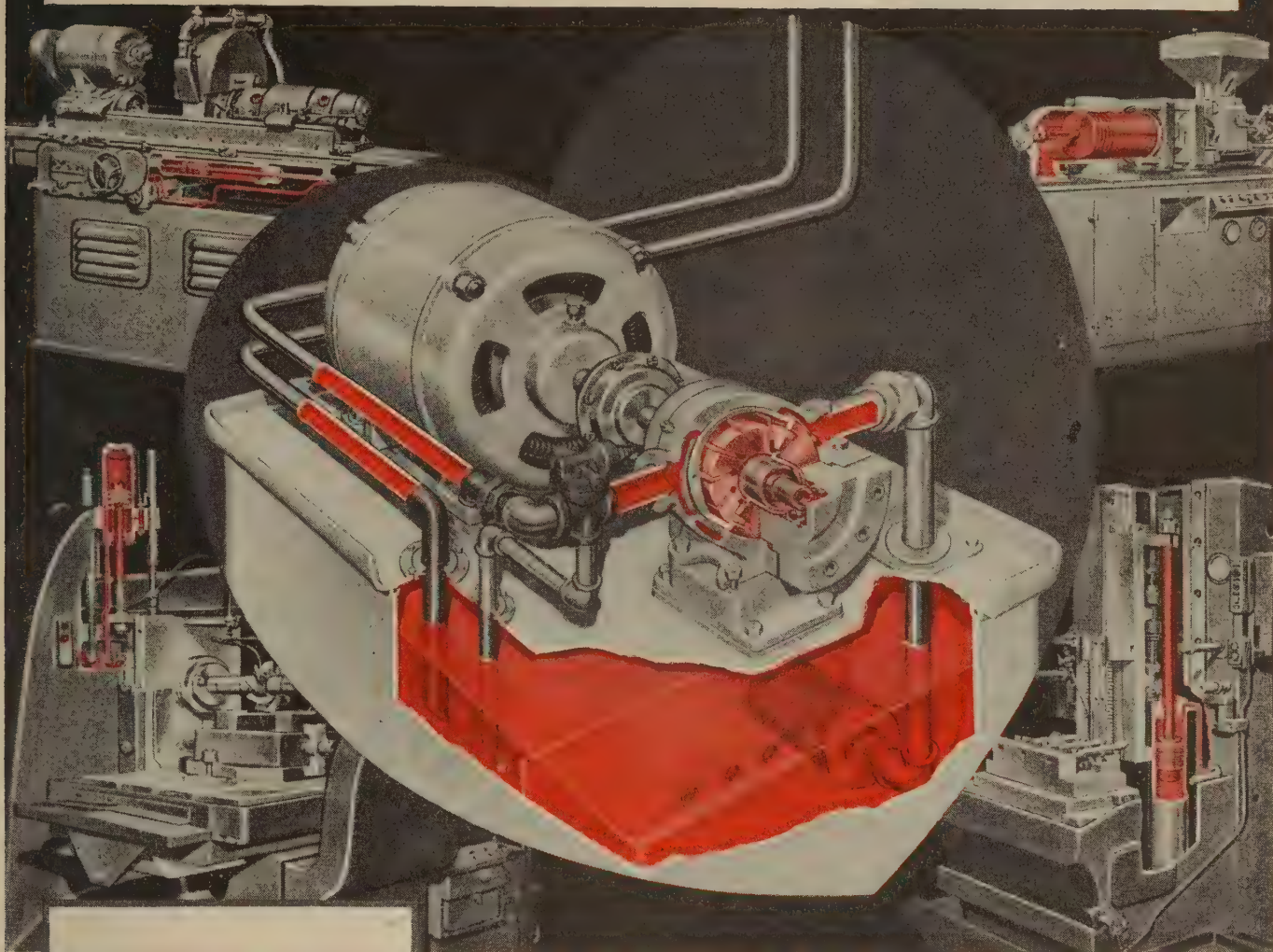
• **Lew E. Wallace** has been appointed general manager of sales, Youngstown Sheet & Tube Co., Youngstown, succeeding **Charles H. Longfield**, who died. Mr. Wallace has been with the company since 1915 and for the last 16 years has served as manager of the New York sales office. He now has his headquarters in Youngstown. **Jay W. Owings**, formerly manager of oil country tubular sales, and **Myron H. Watkins** have been named assistant general managers of sales, Mr. Watkins having served in this capacity for the past two years. Mr. Owings has been with Youngstown since 1928 and Mr. Watkins joined the Cleveland office of the company in 1925.

• **A. D. Murphy** has been appointed director of safety, Crucible Steel Co. of America, Pittsburgh. He had formerly been supervisor of industrial relations at the Atha Works, Harrison, N. J. **Joseph S. Tuite** has been appointed superintendent of power at the Midland works of Crucible. Mr. Tuite had formerly been associated with Youngstown Sheet & Tube Co. in a similar capacity at the Indiana Harbor Works.

• **George D. Cobaugh** has been promoted to St. Louis district sales manager of Harbison-Walker Refractories Co., Pittsburgh, succeeding **Frank Weir**. Mr. Cobaugh joined the company's mining department in 1928 and for the past 10 years he has been connected with the Birmingham sales district.

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From now on, the "heart" of your hydraulic machines—the oil pump—will be able to push new "blood" into machine life-lines. Famous Gargoyle D.T.E. Oils—the oils that have set hydraulic performance standards for years—have been *still further improved* to protect against oxidation deposits (blood clots), rust and wear. They're available now in volume, backed by our 83 years' lubrication experience and skilled engineering service. Put them to work for longer machine life, more continuous production.



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GENERAL PETROLEUM CORPORATION

Rely on **SOCONY-VACUUM**
Correct Lubrication



ROBERT S. GRUVER, administrative assistant, Operating Div., Armco Steel Corp.

• **Robert S. Gruver** has been appointed administrative assistant, operating division, Armco Steel Corp., Middletown, Ohio. **J. M. Lobaugh** has been named to succeed Mr. Gruver as manager of the Ashland, Ky. division where he had been general superintendent. **Harry B. Nicholson** has been made general superintendent at Ashland succeeding Mr. Lobaugh, and **George H. Todd**, assistant general superintendent, succeeding Mr. Nicholson. Mr. Gruver joined Armco in 1925. Mr. Lobaugh joined the company in 1929. Mr. Nicholson started in the blast furnace laboratory of the Ashland plant in 1923. Mr. Todd joined the Ashland plant as an inspector helper in 1928 and had recently been assistant to the general superintendent at the Ashland plant.

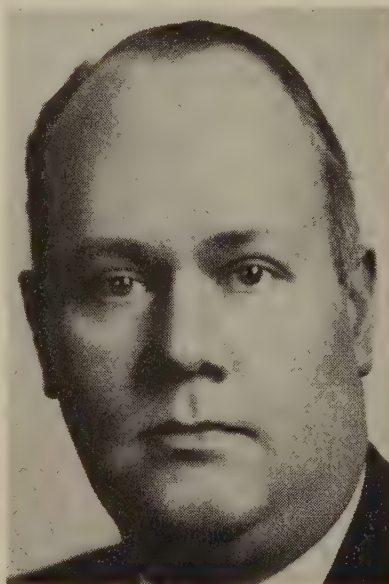
• **Ralph Perkins** has been elected to the board of directors of M. A. Hanna Co., Cleveland. Mr. Perkins is also chairman of the board of Hill Acme Co.

• **Charles A. Herr** has joined Soss Mfg. Co., Detroit, as master mechanic in charge of the tool and die division, including general plant, engineering and maintenance. **Frank Pinto**, who has been in the employ of the company for the past 25 years, has been promoted to general foreman in charge of Invisible Hinge division for the building and cabinet industry.

• **Peter A. Becker** has been appointed general superintendent, Melrose Park Works, Industrial Power Div., International Harvester Co., Chicago, succeeding **Brooks McCormick** who has been transferred to Kansas City as assistant district manager of the general line and industrial district office. Mr. Becker started with International Harvester in 1933. **W. H. Kuhlman** has been appointed general supervisor of advertising and sales promotion of the Industrial Power Div., succeeding **Donald Jones**, and **J. R. Roberts** has been named supervisor of sales promotion, a post formerly held by Mr. Kuhlman. Mr. Jones has assumed new duties as general supervisor of refrigeration advertising and sales promotion for the company.

• **W. A. Walker** has been named assistant to vice-president, finance, Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Walker had 10 years' general accounting experience before joining U. S. Steel in 1941 as systematizer in the accounting department of Carnegie-Illinois. He served in various capacities with the company in the Pittsburgh district and at the South Works, Chicago, before being made audit supervisor of the U. S. Steel Corp. of Delaware, in 1946, which position he held at the time of his present appointment.

W. A. WALKER, assistant to vice-president, finance, Carnegie-Illinois Steel Corp.

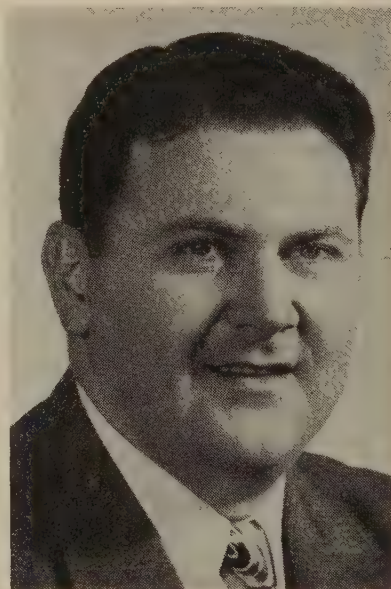


• **Alex K. Tinker** has been appointed manager of the New York branch sales office of the National Radiator Co., Johnstown, Pa. **Fred S. Hudson** has been appointed to succeed Mr. Tinker as Pittsburgh branch manager. Mr. Tinker joined National Radiator in 1928 and later served as vice-president of Lincoln-Niagara Corp., a subsidiary. Mr. Hudson had been a sales engineer since 1936 in the company's Richmond and Washington branch offices. **Robert E. Daly** has been named northwestern district sales representative in Seattle. Mr. Daly had formerly been associated with American Radiator and Standard Sanitary Corp.

• **Richard W. Berg** has been appointed district manager of the Pittsburgh office of the Torrington Co., Torrington, Conn. and South Bend, Ind. Mr. Berg has been with the company since 1944 and had served as district engineer in the Pittsburgh territory since 1945.

• **Richard J. Conroy** has been appointed district manager of the Los Angeles branch office and warehouse of Whitman & Barnes, Detroit. Mr. Conroy has been with the company since 1944 as sales and service engineer in the Chicago district. He had previously served the Independent Pneumatic Tool Co. in a similar capacity.

RICHARD J. CONROY, district manager, Whitman & Barnes.



• **P. A. Malling** has been transferred by the Osborn Mfg. Co., Cleveland, from the New Jersey area to the west coast with headquarters in Los Angeles and San Francisco. **John McGinnis**, formerly of the Cleveland sales service department, now covers the Cincinnati, Kentucky and western Tennessee area. **F. B. Atwood**, who has retired after more than 20 years of service, has been succeeded by **H. C. Donovan** and **G. B. Pecsok**, covering the Vermont and part of Massachusetts area. **Joseph Hammond** has been transferred from the eastern Pennsylvania territory to the New Jersey area formerly occupied by Mr. Malling. **E. M. Schoemmell, Jr.**, formerly of the company's Virginia and Maryland sales area, has been transferred to eastern Pennsylvania. **L. F. Holfelder** has moved his sales headquarters from Cincinnati to the Virginia-Maryland area. **Robert Ruthenberg** has been transferred from the Chicago office to headquarters in Milwaukee, taking over the Wisconsin territory formerly served by **A. L. Nevers**, who has resigned.

• **W. R. Davies** has been named audit supervisor, U. S. Steel Corp. of Delaware. Mr. Davies has had 11 years of public accounting experience and before his promotion had served as assistant to the audit supervisor of the Delaware corporation.

W. R. DAVIES, audit supervisor, U. S. Steel Corp. of Delaware.



• **Hugh H. Trumbull** has joined the sales organization of the United Steel Products, Worcester, Mass. Mr. Trumbull had formerly been connected with the Sharon Steel Corp.

• **J. W. Fairbanks** has taken a new post as western division manager of the Electric Auto-Lite Co., Toledo, with headquarters in Los Angeles, succeeding **D. M. Skirving**. Mr. Fairbanks formerly served as central division manager in Chicago. **R. F. Maw** has taken over the position of central division manager.

• **John G. Kirkpatrick** has been appointed exclusive representative in the Pittsburgh area for the Brooks Rotameter Co., Lansdale, Pa. Mr. Kirkpatrick has served as instrument engineer for the Koppers Co. for the past seven years.

• **Gordon R. Graham** has been appointed general auditor, National Supply Co., Pittsburgh. He has been identified with National Supply since 1945, serving as controller of the company's Spang-Chalfant Div. plant at Etna, Pa. Mr. Graham succeeds **W. T. Windle**. **Eugene F. Thayer**, formerly supervising senior accountant of the Pittsburgh office staff of National Supply, succeeds Mr. Graham as plant controller at Etna.

GORDON R. GRAHAM, general auditor, National Supply Co.



K. B. HOLLIDGE, executive vice-president and secretary, Arthur Colton Co.

• **K. B. Hollidge** has been appointed executive vice-president and secretary of the Arthur Colton Co., Detroit, which company has recently been purchased by Snyder Tool & Engineering Co. **Clarence Snyder** is chairman of the board and vice-president; **Howard N. Maynard**, president and treasurer; **Harvey W. Purdy**, assistant secretary; **Samuel D. Harrison**, assistant treasurer; **Alfred W. Kath**, director of engineering; **Nelson Carman**, director of sales.

• **Carl F. Prutton** has been appointed vice-president, director of operations of all plants of Mathieson Chemical Corp., New York and **Arthur T. Bennett** has been placed in charge of the eight plants acquired from Southern Acid & Sulphur Co. **R. B. Worthy** and **J. F. Newell** have been named vice-presidents. Dr. Prutton, who joined Mathieson last year as director of research, has charge of research and supervises operations of all plants including those recently acquired. His headquarters are in New York. Mr. Bennett has his headquarters in Houston. Mr. Worthy, who has been manager of the Saltville, Va., plant, now has charge of the plants acquired from Standard Wholesale Phosphate & Acid Works, as well as Saltville. Mr. Newell remains at Lake Charles, La., where he has been in charge of the alkali and ammonia plants.



T. J. MANNING, assistant to president, Evans Products Co.

• **T. J. Manning**, formerly vice-president of Howell Electric Motors, has been appointed assistant to the president, Evans Products Co., Plymouth, Mich.

• **J. D. Wright** has been named general manager of Thompson Products, Inc., Cleveland. Mr. Wright also serves as vice-president and secretary. **L. W. Reeves**, special products division manager, has been named vice-president of that division. **Harry D. Bubb** has been appointed vice-president of the Tapco division. He had formerly been manager of that division. **M. P. Graham**, manager of the plant at Detroit, has also been named a vice-president of the Tapco division. **Paul D. Hileman**, manager of the West Coast plant at Los Angeles, has been named a vice-president of that division. **G. R. Moore**, formerly salesman in the valve and jet division, has been appointed manager of the new valve division. **Andrew Karabinus**, factory manager, has been appointed assistant manager of the valve division. **John D. Gates** has been named sales manager and **John Newton**, formerly sales engineer, has been named chief engineer. **Irwin A. Binder** has been promoted to assistant manager of the jet division and **R. E. Cummings** has been named manager of sales and engineering. **E. P. Riley** has been

appointed assistant manager of the parts and accessories division. **R. T. Lewis** has been named sales manager of the Tapco light metals division. **C. W. Ohly**, engineer at the Clarkwood plant, has been appointed assistant manager. **R. M. Ward**, formerly eastern sales representative, has been named sales manager.

• **Joseph H. Robinson** has been appointed director of personnel for the New Departure Div., General Motors Corp., in Sandusky, Ohio. Mr. Robinson had formerly served as assistant personnel manager for the division in Meriden, Conn. **Louis C. Freeman, Jr.**, head of the division's salaried personnel section since 1947, has been appointed personnel manager of the Meriden plant.

• **James E. Power** has been appointed manager of national accounts sales for the mechanical goods division, U. S. Rubber Co., New York. **W. A. Tipton** has been named manager of branch sales for the mechanical goods division and **O. S. True** has been appointed district sales manager for the division's New York branch.



JAMES F. McCARTNEY, eastern district sales manager, Duff-Norton Mfg. Co.

• **James F. McCartney** has been named eastern district sales manager, Duff-Norton Mfg. Co., Pittsburgh, succeeding **G. L. Mayer**, who has retired, but who continues with the company in an advisory capacity. Mr. McCartney had been associated with Pressed Steel Car Co.

(Continued on Page 134)

OBITUARY...

• **Anna L. Hugus**, 56, for the last seven years coordinator of raw materials, and an expert on the use and analysis of pig iron, Carnegie-Illinois Steel Corp., Pittsburgh, died March 29.

• **Harrison W. Fitzgerald**, 76, well-known consulting engineer who had served with Bethlehem Steel Co., Lackawanna Steel Co., Donner Steel Co., Armco Steel Co., and others, died March 9.

• **George H. Clapp**, 90, founder of the Aluminum Co. of America, Pittsburgh, and the oldest alumnus of the University of Pittsburgh, died March 31.

• **Noah P. Brown**, 63, mechanical foreman, Huntley Steam-Electric Station, Buffalo-Niagara Electric Corp., Buffalo, and a former president of Associated Welders of Western New York, died March 27.

• **Irving L. Burrows**, 62, of the Equipment and Products Engineering division of Behr-Manning Corp., Troy, N. Y., died March 30.

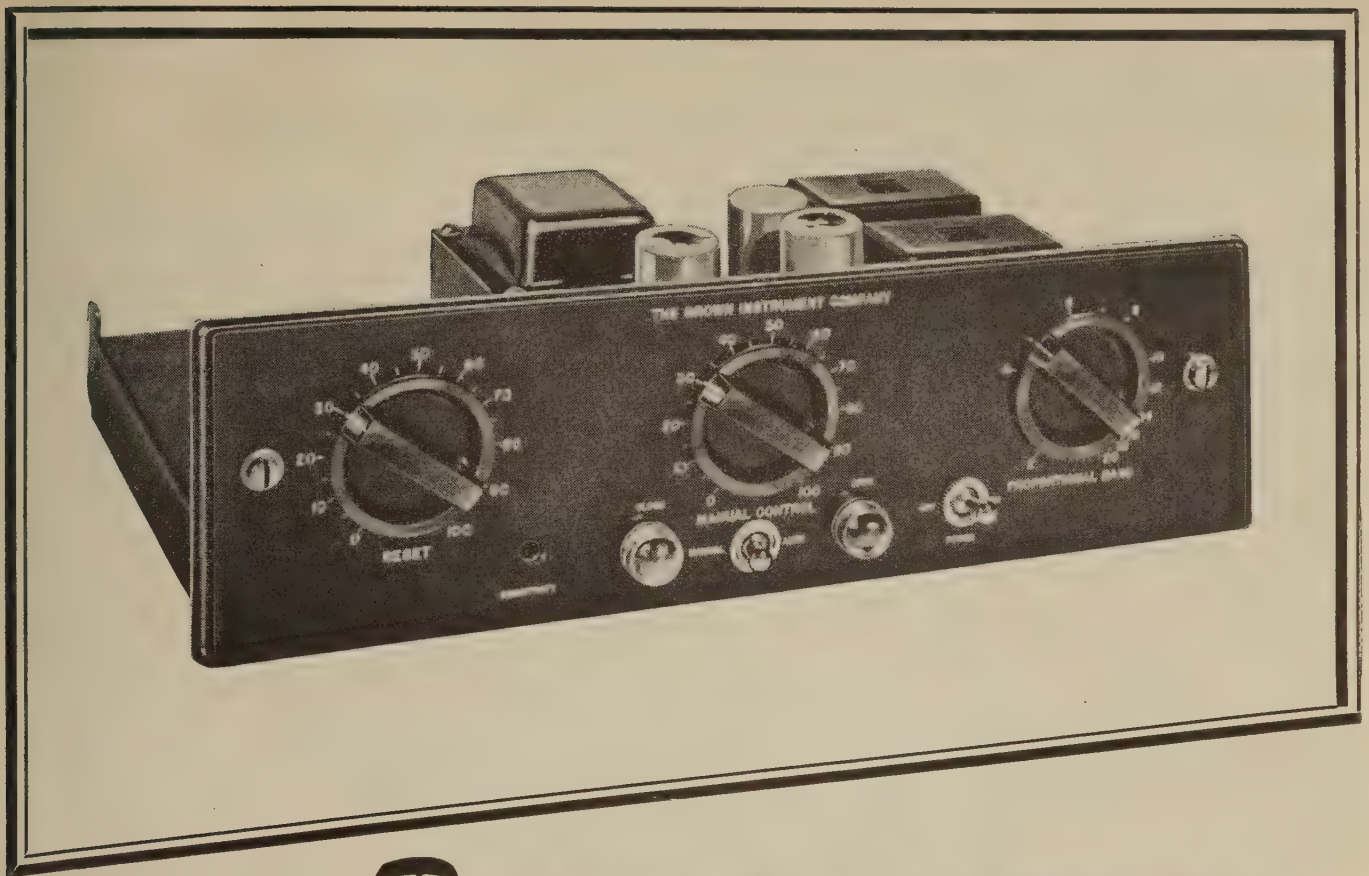
• **Carl A. Schumacher**, 77, formerly of the American Bridge Co., and more recently retired superintendent of Albion Malleable Iron Co., Albion, Mich., died March 24.

• **Arthur F. Dietrich**, 65, chief accountant of the Niagara Machine & Tool Works, Buffalo, died March 29.

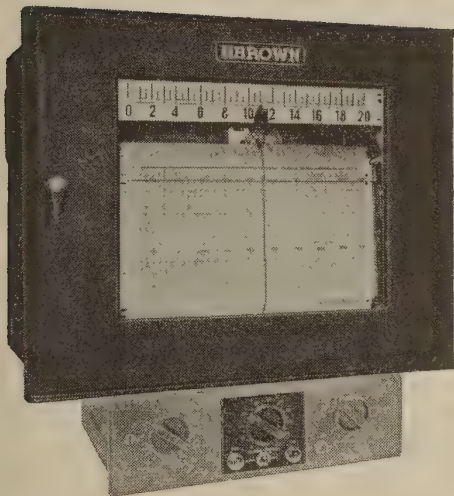
• **William L. Gorman**, 60, maintenance foreman of the Buffalo Forge Co., Buffalo, died March 28.

• **Frank H. Stohr**, 47, general manager of the Norwood, Ohio plant of Allis-Chalmers Mfg. Co., Milwaukee, died March 29.

• **Elmer A. Steckel**, 68, founder and retired president, American Iron Works Corp., Denver, died April 2.



Picture OF A "PLUS" ...In Proportioning Control



Brown electronic proportional control relay (shown with cover door in phantom) with the *ElectroniK* Strip Chart Controller. It may also be used with the *ElectroniK* Circular Chart Controller . . . and is available for new or existing proportioning control installations.

Here's a "plus" that you can see and evaluate in terms of better production at lower cost. It's the new Brown *electronic proportional control relay* . . . the relay that permits you to take full advantage of the extreme sensitivity of your *ElectroniK* Controller.

The extra features of this new, compact unit include unmatched sensitivity and stability, positive action, manual reset adjustment, signal lights to indicate valve operation, and an adjustment of 24% to 206% of the nominal proportional band value of the instrument resistor. Designed for flush-mounting, its drawer-type construction makes it easily accessible.

All of these features add up to a big "plus" in proportioning control that deals in dollar and cents results. Write, today, for Specification Sheet #193 . . . or call your local Brown engineer for free consultation and advice.

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Advanced Instrumentation
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European Letter . . .

• America's departure from isolationism turning point of the century . . . Atlantic Pact promises liberation rather than assurance against invasion . . . Alliance must constitute a beginning, not an end.



LONDON — The signing of the Atlantic Pact in Washington on April 4 was a solemn and triumphant occasion, and yet in some ways an equivocal one. The seven statesmen representing the nations which originally framed the pact, the United States, Canada and the Brussels Powers, could feel justified pride in all the patient work of drafting and negotiating represented by the treaty terms. The twelve Foreign Ministers together could feel with Mr. Bevin that their achievement would bring a new sense of security and "a great feeling of relief to millions of people." Above all, everyone present in the auditorium or listening to the ceremony over the radio or reading of it through the length and breadth of the Atlantic world, must have felt that some historical miracle had taken place when Mr. Dean Acheson stepped forward to add the signature of the United States and President Truman to declare that by this treaty the American people pledge themselves to maintain close relations with their eleven partners and "to come to the aid of any one of them that may be attacked."

American isolation has lasted so long and played so heavy a role in the preparation and early stages of two world wars that its formal disappearance constitutes one of the

turning points of the century. The sense of wonder at the change has been a little blunted by the slow and steady evolution of the last two years. When the treaty was finally signed on Monday, people had, no doubt, to jog themselves to remember how strange and wonderful the American response had proved to be. But if any treaty-signing can be a landmark in history, it is the signature which marks, more specifically than the Charter of the United Nations, the end of America's isolation from the outside world.

SHOULD not the occasion then have been one of unmixed congratulation and content? Yet it clearly was not so. Most of the speeches showed an undertone of concern and, almost without exception, the statesmen stressed their belief that the signing of the Pact represented a beginning, not an end. And in a strict and literal sense, this is, of course, true. In the first place, the Pact will not come into effect until it has been ratified by seven Powers, including the United States, and there is more than a possibility that the Senate will postpone ratification for a considerable time. Four weeks have

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been lost on the Senate's filibuster; approval of the second year's contribution to Marshall Aid has taken much longer than was expected; a whole backlog of urgent domestic legislation has still to be considered; and Senator Scott Lucas is thinking of a special session in the summer to which ratification of the Pact, among other things, may be deferred.

Ratification is not the only hurdle in the way of the effective functioning of the Pact. In its present form it is still more of a promise to western Europe of eventual liberation than an assurance that invasion can never take place. For it to become a full instrument of secu-

rity, its strategic implications have to be agreed and the scale and distribution of rearmament assessed. American military authorities are fully aware that immediate defense and eventual liberation are different matters. They know that it is in American as well as European interests that a potential enemy should be held on his own frontiers and not permitted to overrun all America's allies, leaving the United States in complete geographical isolation. General Bradley, Chief of Staff of the United States Army, made the point with great cogency and force three days ago:

It must be perfectly apparent to the people of the United States that we cannot count on friends in western Europe if our strategy in the event of war dictates that we shall first abandon them to the enemy, with a promise of later liberation. Yet that is the only strategy that can prevail if the military balance of power in Europe is to be carried on the wings of our bombers and deposited in reserves this side of the ocean. It is a strategy that would produce nothing better than impotent and disillusioned allies in the event of war.

This did not mean, the General continued, that the whole matter of defense could be left in supine fashion by the European nations to the Americans. But if the Europeans were

. . . to save themselves, they must have the will and the means to resist. This will to resist is developed partly by possession of the means—tanks, planes, guns—and partly by the assurance that they would be adequately helped in sufficient time.

THE General's views are fully shared by the American administration and no attempt has been made to hide from Congress the fact that the Atlantic Pact will be effective only if it is accompanied by a large assignment of arms to western Europe, and by the evolution of a defense plan which involves American military commitments in Europe. Both these possibilities are, however, highly unpalatable to a minority in the Senate. Senator Taft has placed on record his hesitation at the thought of the United States becoming the policeman of western Europe. And at a time when the present revenue of the American government may be insufficient to cover existing commitments and the pas-

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Announces...



JM-3000
Insulating
Fire Brick

**... sets a new high of 3000 F
for insulating fire brick service**



● Here is a new insulating fire brick, especially developed by the Johns-Manville Research Laboratory for use in forge furnaces, ceramic kilns, chemical process furnaces and other types

of high-temperature equipment operating above the previous range of insulating fire brick.

Some of the more outstanding advantages of JM-3000 Insulating Fire Brick are: It is the highest temperature insulating fire brick made for backup or exposed use, effectively withstanding the full 3000 F. Its efficiency remains at a high level throughout the life of the brick. It has exceptional service advantages in many operations at lower temperatures where regular or special fire brick is ordinarily used.

With its combination of outstanding insulating and refractory properties, JM-3000 Insulating Fire Brick has been found to provide longer life, greater fuel economy and important savings in downtime. For further information, write to Johns-Manville, Box 290, New York 16, N. Y.

PHYSICAL AND THERMAL PROPERTIES

Molded from high quality kaolin clays plus alumina

Density—63-67 lb per cu ft

Modulus of rupture—200 lb per sq in.

Linear shrinkage—(24 hr Panel test @ 3000 F) .8 per cent

Linear thermal expansion to 2000 F—.5 to .6 per cent

Pyrometric cone equiv.—Cone 37+ (3308 F+)

Temperature limit—3000 F

Conductivity (Btu in. per sq ft per F per hr at mean temp)

F	500	1000	1500	2000
Btu	3.10	3.20	3.35	3.60

Johns-Manville

First in
INSULATIONS

sage of the ERP appropriation is running into stiffer opposition than was at first expected, Senator Taft will not be alone in deploring an Arms Bill of at least a billion dollars, which can be met only by deficit financing or by conceding the increases in taxation for which President Truman has pressed.

There is thus, even in the short run, some rough ground to cover before the Atlantic Pact can become a really effective instrument of security. Nor is the outlook for the longer run entirely smooth. It is true that America's departure from isolationism is epoch-making; yet, behind all the freshness and strangeness of full American participation in Atlantic defense, lies the fact that the Americans are only doing what other sovereign states have done again and again through the centuries—they have joined in a defensive alliance against a potential aggressor. If peace and full security could be automatically secured by such a means, they would not have proved illusory so often in the past. A genuinely new approach to security represented first by the League of Nations and later by the United Nations has been frustrated twice in a generation. Although, in one sense, the Atlantic Pact can be

smuggled in as a regional agreement within the Charter of the United Nations, the Foreign Ministers on April 4 made no secret of their realization that the new Pact is to some extent a retreat. As Mr. Bevin put it, when trust in the United Nations vanished with the Russian veto, "we had to get together to build with such material as was available to us."

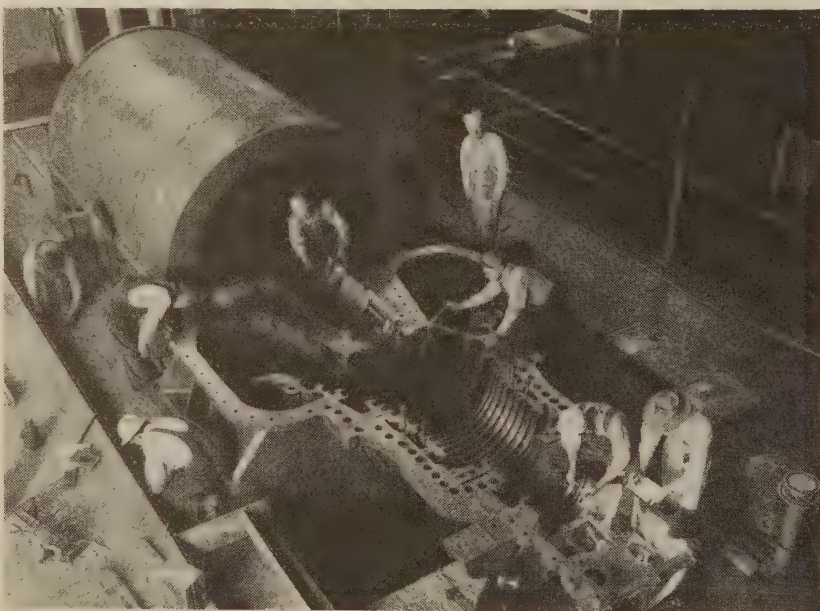
THE great question therefore before the signatories of the Atlantic Pact is whether the ceremony on April 4 was the end or the beginning. Would they be content to rely on an old-fashioned defensive alliance and leave diplomacy and the play of national interest to look after the rest? Or would they go forward to seek both among themselves and with the rest of the world new methods of cooperation and association? Mr. Lester Pearson, speaking for Canada, took this hopeful line when he asserted

our treaty is no mere Maginot Line against annihilation, no mere foxhole from fear, but a point from which we start for yet one more attack on all those evil forces that would block our way to justice and peace.

But what form is this attack to take? The first step, military consolidation, has at least been considered, an Arms Bill has been drafted,

the mechanism for closer staff talks exists in their combined Anglo-American Chiefs of Staff in Washington and the military organs of the Western Union. But long-term political consolidation has not yet even been considered. If no more is attempted than exists today, the Atlantic Alliance will be no more permanent a foundation of political cooperation than was the system of alliances which existed in Europe before both wars. And, without lasting political association, all talk of permanent economic cooperation to follow the ending of Marshall aid is so much spent breath. It is, above all, in the larger political sense that the signing of the Atlantic Pact must be a beginning, not an end. If the western powers can go no further towards political association than they went on April 4, their alliance will ultimately share the fate of all alliances. It will drift apart. If, on the other hand, the Atlantic Pact is to become the nucleus of a permanent political organization of the free world, a community capable of meeting the modern challenge of atomic power and supersonic flight, then work on the elaboration of new forms of association must begin at once. Everything has shrunk in the modern world, except the pretensions of national sovereignty. If the Atlantic Powers can attack that last bastion of separatism and isolation, then their Pact will go down to history as a real landmark and April 4 as one of the few genuine turning points in modern history.

TURBINE ERECTORS: Installing a new General Electric steam turbine-generator at the Big Sioux Station of the Sioux City Gas and Electric Co. The turbine rated at 10,000 kw, will operate at a steam pressure of 325 psi, 700° F and exhaust pressure of 1.5 in. Hg abs. It will drive the direct connected 6600-v generator at 3600 rpm.



Sets Production Record

Cleveland

• • • New production records were set during March, 1949, at the American Steel & Wire Co.'s Donora, Pa., Steel and Wire Works. A new plant record of 81,880 tons was established for openhearth and ingot production in March. The best previous production record was 78,189 tons in December, 1947. Another March works record was created when rod production jumped from 52,164 tons in January, 1949, an all-time high, to 55,672 tons. The finishing department at the Donora Steel and Wire Works also participated in the month's production achievement by breaking 25 former daily, weekly and monthly production records.

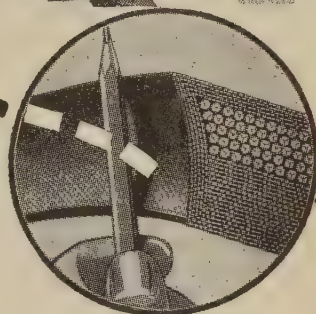
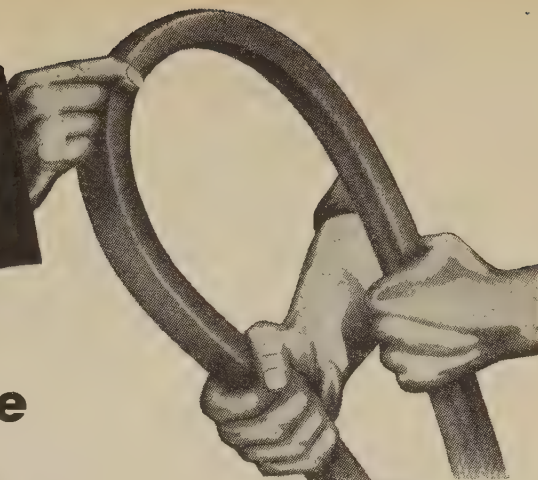
Make this Test
with ANY V-Belt

You'll See at Once Why the

CONCAVE SIDE...

(U.S. Patent No. 1813698)

Saves You Money!



Bend any V-Belt and feel the sides change shape. The top of the belt, under tension, *narrows*. The body, under compression, *widens*. The sides of the belt bulge out.

The result, if the belt is built with *straight sides*, is a shape that does not fit the sheave groove—as shown in Figures 1 and 1A, below.



Fig. 1
Straight-Sided V-Belt

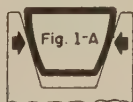


Fig. 1-A
How Straight-Sided V-Belt Bulges in Sheave-Groove

Clearly, the bulging of the sides will produce excessive wear along the *middle* of the sidewall as indicated by arrows.

Now, bend a V-belt with the *concave* side—the Gates Vulco Rope.

You get the same shape change but *now* the new shape exactly fits the sheave groove—as shown in Figures 2 and 2A.

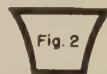


Fig. 2
Gates Vulco Rope with Concave Side.



Fig. 2-A
No Side Bulge. Precise Fit in Sheave-Groove.

Results? (1) *Uniform* sidewall wear; *longer life!* (2) Full sidewall grip on the pulley. Carries heavier loads and *sudden load increases* without slippage; *saves belts* and also *saves power!*

The Concave Side is **MORE IMPORTANT NOW** Than Ever Before

Because the *sides* of a V-Belt are what actually *drive* the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley *directly* through the belt's sidewalls.

Now that Gates SPECIALIZED Research has made available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side is naturally more important in conserving belt life today than ever before.

THE GATES RUBBER COMPANY
DENVER, U.S.A.

The World's Largest Makers of V-Belts

494



REG. U. S. PAT. OFF.

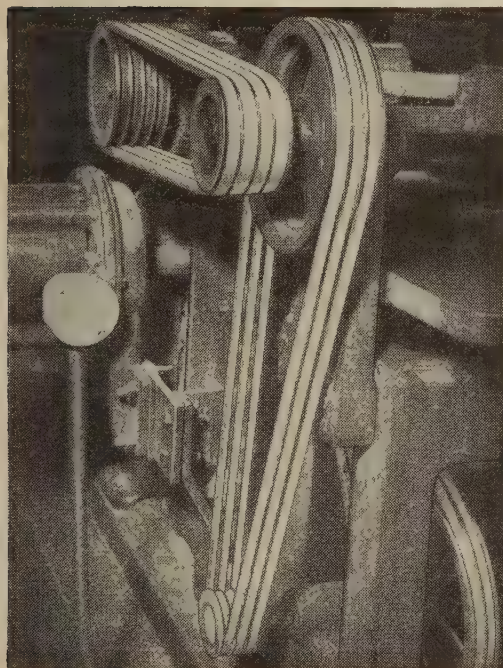
The Mark of SPECIALIZED Research

GATES VULCO ROPE DRIVES

Engineering Offices
and Jobber Stocks

IN ALL INDUSTRIAL CENTERS

of the U. S. and
71 Foreign Countries



• **PREMIUMS GO**—Jones & Laughlin Steel Corp. announced some competitive price reductions on Apr. 7. Hot-rolled sheets were cut \$1 a ton to the going price of \$3.25 per 100 lb. Hot-rolled strip was also reduced by the same amount to \$3.25. In addition to the usual reductions due to the drop in zinc, J & L also slashed certain sizes of seamless, standard and line pipe by \$5 to \$10 per ton to competitive levels. Seamless casing and drill pipe were cut \$1 and \$2 a ton respectively. Oil well tubing was not reduced.

• **COAL THREAT**—Threat of a coal strike to the steel industry is very real and the industry is correct in not minimizing it. However, it is entirely possible in some cases that steel sales people are using it as helpful propaganda to discourage the unloading of inventories by over-stocked consumers. Another sign of the times is the quiet reduction in the prices of mill seconds and other sub-marginal grades by some segments of the industry.

• **GALVANIZED**—Following the \$20 per ton decrease in zinc prices Carnegie-Illinois Steel Corp. reduced coating extras on galvanized sheet about \$1.25 per ton, depending on gages involved. Under a similar formula National Tube Co. increased base discounts on galvanized pipe by 1 point, equivalent to a reduction of \$2 per ton.

• **STEEL REDUCTIONS**—Alan Wood Steel Co. announced the following reduced prices in steel products last week: Carbon steel plates \$3.55 per 100 lb; hot-rolled sheets \$3.75; Dynalloy sheets \$4.95; rerolling billets \$57 per net ton; forging billets \$63; alloy billets \$65.

• **REDUCES STRIP PRICE**—Acme Steel Co. on Apr. 13 reduced hot-rolled strip prices from \$3.30 to \$3.25 per 100 lb f.o.b. their mill Chicago. They also reduced cold-rolled strip prices from \$4.25 to \$4.15 per 100 lb. Acme is the only major producer of strip in the Chicago area.

• **SILVERY IRON**—Pittsburgh Metallurgical Co. has reduced its price of electric furnace silvery iron for April shipment \$6.25 a ton. The new price for 14.01 to 14.50 pct silicon is \$78.50, f.o.b. Niagara Falls

• **FREIGHT CARS**—Domestic freight car deliveries during March totaled 11,882, according to American Railway Car Institute. This was the highest production month since the 10,000-car program was initiated in March 1947.

• **CUTS BARS**—Effective Apr. 1, Laclede Steel Co. reduced the price of hot-rolled carbon bars \$10 a ton. The new price of \$3.35 per 100 lb is now competitive to the price on this product charged by the large mills in the Midwest. Prior to this change the company had also reduced strip prices so that their major products are now on a competitive basis with other producers.

• **QUOTA SYSTEM ENDS**—As far as buyers of almost all steel products are concerned the historical quota system introduced after the war to assure a fair distribution of steel on a historical basis is dead. One big steel company now uses the quotas for exactly opposite to the original purpose: What once were allocations have now become sales quotas for the district offices.

• **HIGH COST**—Republic Steel Corp. is shipping about 30,000 tons of iron ore, all rail, from northern Michigan to plants in Gadsden, Ala. Cost per ton unit is approximately double for this ore as compared with southern ore delivered to Gadsden. U. S. Steel Corp. has also been shipping all rail from the northern ranges to Tennessee Coal Iron & Railway Co. at Birmingham.

• **CF&I RAIL PRICE**—Colorado Fuel and Iron Co. officials in Denver told THE IRON AGE their new price on rails effective Apr. 6 is \$3.30 per 100 lb. This is equal to \$66 per net ton, or \$2 more than other major rail producers charge. Previous price was \$6 more.

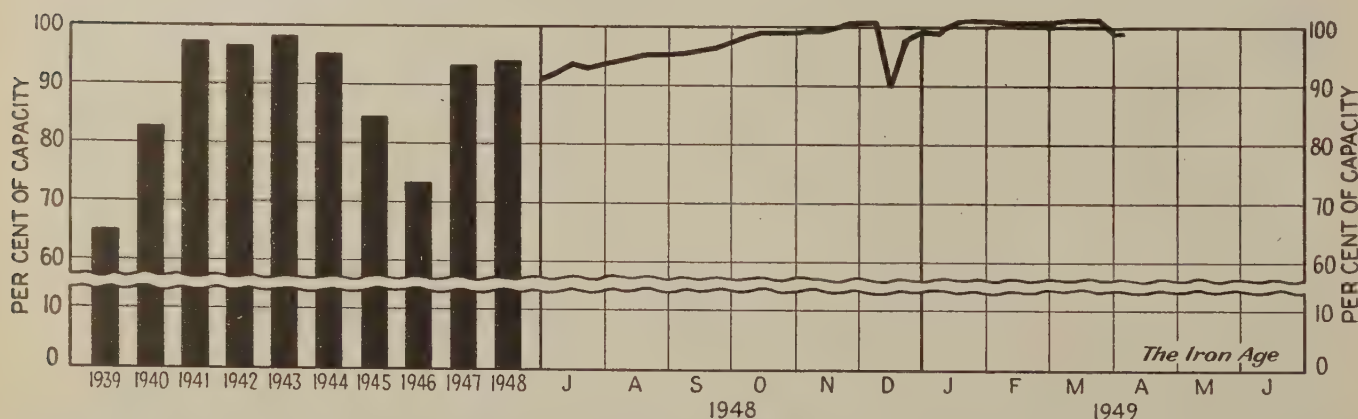
• **FERROALLOY PRICE**—Reductions in the price of Alsifer have been announced by Vanadium Corp. of America. Carload lots are priced at 8.15¢ per lb, a reduction of ¼¢. Ton lots are priced at 9.55¢, 0.15¢ per lb lower than previously.

• **INLAND CUTS RAILS**—Inland Steel Co. cut the price of rails \$6 a net ton effective Apr. 6. New price is \$3.20 per 100 lb, equal to that charged by the larger mills. Wilfred Sykes, president, said this "competitive" cut would deny Inland "fair profit" on this item.

• **PIG IRON LOWER**—A reduction of \$2 per ton has been announced by the Alan Wood Steel Co., bringing down basic iron to \$48, foundry to \$48.50.

• **WORTH PRICES**—Worth Steel Co. has announced a carbon steel plate price of \$3.65 per 100 lb Claymont, effective Apr. 6. Flange shop products are priced at \$3.45.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
April 5.....	101.5*	99.0	94.5	99.0	102.0	105.0	101.0	94.0	107.0*	106.0	110.0	77.5	98.5	99.5
April 12.....	101.0	100.0	94.5	98.0	101.0	105.0	102.0	94.0	104.5	100.0	103.0	84.5	88.5	99.5

* Revised.

Industrial News Summary

- **Inflationary Steel Days Are Over**
- **Incoming Business at Lower Rate**
- **Scrap Off \$2.59 a Ton to \$23.58**

STEEL people are afraid that when it becomes generally known that the honeymoon is over in that basic industry, undue significance will be attached to the leveling off process. Yet that is what has been said in steel for the past year—the current easiness had to come sooner or later. It came later than some steel sales people thought it would. And it came much sooner than most government people thought it would.

This week there is no doubt that (1) the industry is in a buyers' market, (2) the ingot rate is pointed slowly downward, (3) base steel prices will be tested before the year is out, (4) steel users are getting rid of inventories that loom large in comparison with their sales and (5) steel firms will soon be taking all the orders that are offered to them.

The so-called quota system in steel is almost out the window. Only plates and pipe are scheduled on the basis of strict customer quotas. All other items are being booked pretty much as orders are received. But there is so much difference between conditions this week and 6 months ago that it is hard to believe.

Steel order volume has decreased in the past few weeks. So much so that a few steel firms are happy that they started to take extra business over and above what they thought they would produce in the second quarter. It is now the general practice on all steel items except plate and pipe to enter business the same as in prewar years. Some steel firms are using the old quota setup as a sales bogey for district offices—the exact reverse of its use several months ago.

These changes in steel do not mean that the country's No. 1 industry is grinding to a halt. Far from it. But they do mean that the long trek upward has stopped. It had to, when customers felt that war-induced demand was satisfied and when order volume was based on need and not on worry over availability. In all previous years (except for a short time in 1929) the steel industry has never operated for long at, or above, 100 pct except in time of war.

DURING prewar years steel production averaged around 74 pct of rated capacity. It looks this week as if the industry is headed toward a more normal operating activity. Whether in the process of getting there the slide off will continue further remains to be seen.

There are many in the industry who privately think the pattern now shaping up looks like 1937-38. Then the steel rate dropped off sharply in the second half of 1937 and continued downward until well into 1938. If the present trend

turns out that way the rate will go considerably below 75 pct which appears to be the midpoint of recent guesses on how low the rate will go this year.

While some smaller steel firms are studying the absorption of freight "on an individual basis" so as not to become involved in the f.o.b. fracas, larger firms are not so sure it can be done by them. Even the so-called moratorium on the entire basing point controversy suggested in current bills is not enough for some steel firms. They feel that until the Supreme Court acts and gives a crystal clear opinion on the right of steel firms to absorb freight in competing in distant areas no absorption will be considered.

But there are other ways that steel consumers are getting their steel cheaper than the full railroad rate. Barge shipments are increasing. More and more steel is going out by truck. In one Midwestern area the truck shipments of steel run as high as 62 pct of the steel leaving that plant.

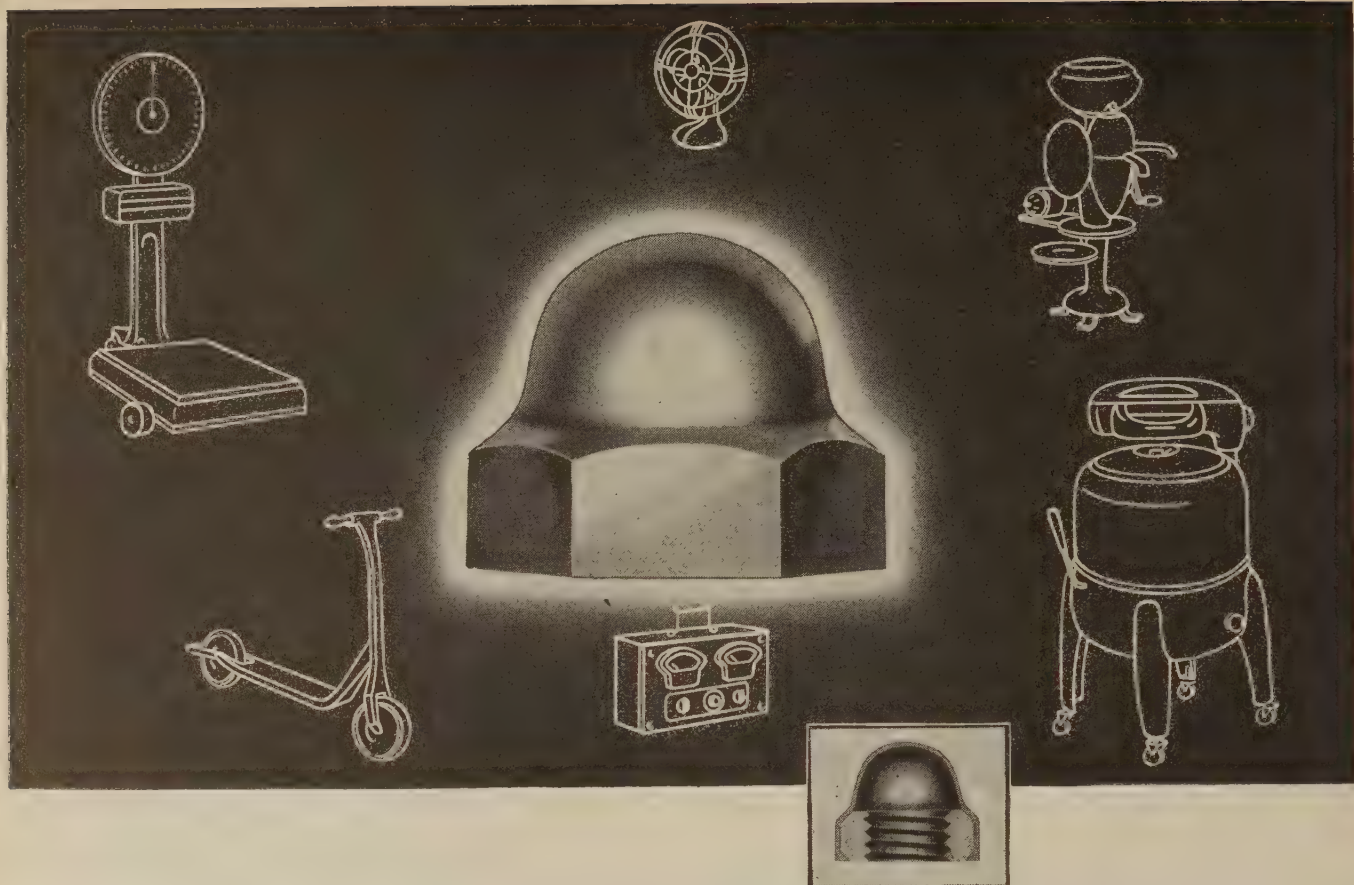
ALSO steel users are demanding and getting exactly what they want in steel. No longer are cold-rolled sheets being used when hot-rolled sheets at a cheaper price are required. Some customers are getting so quality conscious that they are calling and getting steel mill metallurgists on quality cases.

With all these signs of every day buying habits is the increase in the number and tonnage of cancellations. And on top of this the volume of new business is off this week from a month ago. Just how much seasonal factors will return to the steel market is yet to be determined.

Steel scrap prices were off sharply again this week. The drop was not as big as a week ago but it was plenty large. No. 1 heavy melting steel was off an average of \$5 a gross ton at Chicago; \$1.75 at Pittsburgh and \$1 at Philadelphia. THE IRON AGE steel scrap composite is down \$2.59 a gross ton to \$23.58 a gross ton.

The scrap composite has fallen \$19.42 a ton since the first of this year and has reached the lowest point since Nov. 10, 1946, when OPA ceilings went off scrap. THE IRON AGE steel scrap composite this week is only \$4.41 a ton higher than the OPA ceiling average of \$19.17.

The steel ingot rate is unchanged this week at 99.5 pct of rated capacity. Some mills are working off backlogs because orders have not been fully up to operations if cancellations and bonus tonnages are considered.



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These ornamental Ferry Patented Acorn Nuts cover unsightly bolt ends. They fit securely, and give that finishing touch of quality to almost any product.

They consist of a steel hexagon nut fitted snugly into a steel shell. Supplied in materials—steel and brass covers with steel inserts with plain and various platings and finishes such as: plain, cadmium plated,

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Dress up and enhance the appearance and value of your assemblies with these attractive, ornamental Ferry Patented Acorn Nuts. A small investment in these nuts often pays for itself many times over. Let us send you folder and prices.

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Competition Strong In Steel Market; Base Prices Due For Test

New York

• • • There is no longer any doubt that (1) the steel industry is in a buyers' market, (2) the ingot rate is pointed slowly downward, (3) steel base prices will be severely tested before the end of the year, (4) steel customers will soon live off inventory as long and as much as they can, and (5) steel firms will soon be taking all the orders that are offered them.

That in a few words tells what the pitch is in steel these days. It is plain that when the industry is not going up it is going down. There are plenty of guesses what will happen in steel over the next several months. All of them are stabs in the dark. But there is now enough evidence to believe that there are tough times ahead for steel.

Many steel consumers are now taking more steel than they really feel they need because there may be a long coal strike and there may be steel labor trouble. They feel that there is a chance that the European situation may tighten up the supply. But facts are gathering which indicate that the American steel industry can take care of Europe and a whole lot more.

Customers are now cagey. They want good steel. They insist on the letter of the law on specifications. They want quick delivery. And they want everything they can get—on their terms.

There has been a lot of talk about pressure on steel prices. There is nothing new in that. There has always been pressure on steel prices in a buyers' market. But this pressure has never brought a wide open break in the regular mill price unless and until there has been a low operating rate. The last time there was a wide break, or basement sale of steel, was in 1938. A lot of water has been over the dam since then.

In 1938 some steel companies were cutting prices on the quiet—hoping that no one else would know it. This was done to keep their mills going when the backlog ran out. The only thing wrong was that within about 48 hours their

But This Won't Come Until The Operating Rate Is Down Substantially

By TOM C. CAMPBELL
News-Markets Editor

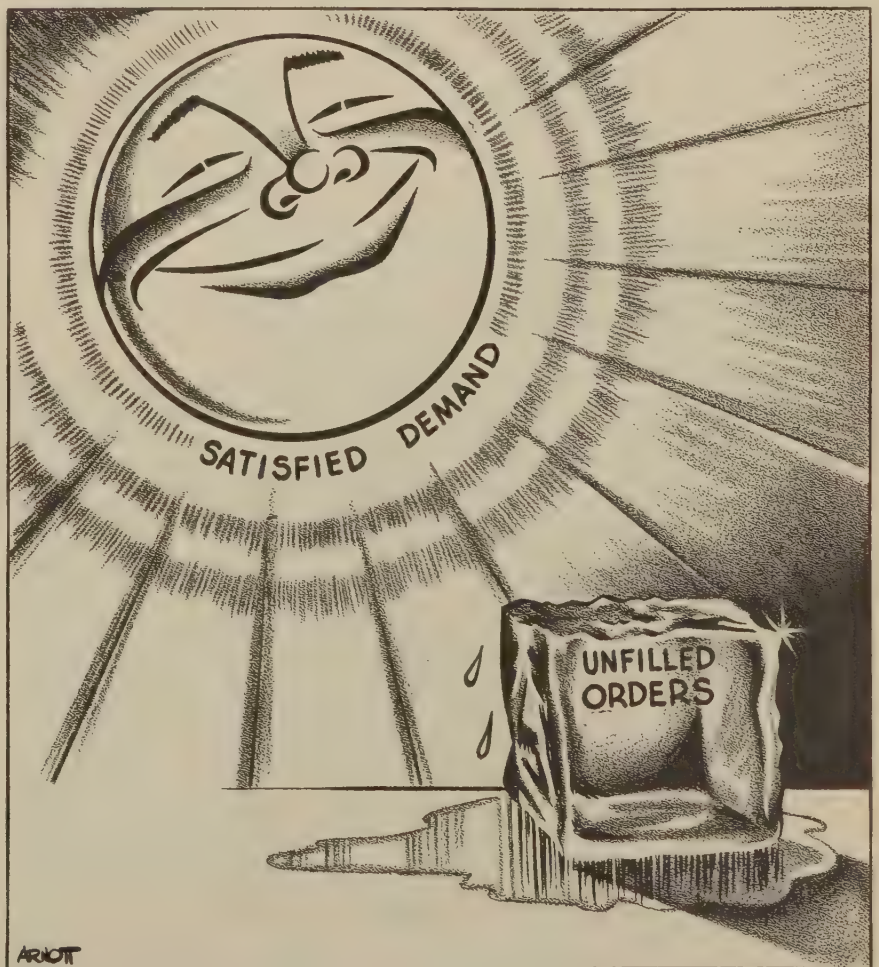
cuts were known all over the trade—and were met by other companies. Then more cuts were made. They were met. Each time someone tried to get a backlog at a cut rate they lost the advantage—because someone else either met the cut or went it one better. To cap the climax the government stepped in and froze steel prices at the low

point—which accounted for all the "sweating it out" the industry did during the war.

Now things are a little different. Premium prices are out the window, except for a few cases. Lower demand and increasing competition have forced the trend to a single price in most areas for the same products. The f.o.b. setup has muddled the waters because if the mill can't absorb freight—which it won't until clearcut legal rights are provided—it will have to cutback operations.

That single price, with or without freight absorption, will stay as long as demand will support it. Before any significant cutting of steel prices comes there are to be considered (1) the coal contract, (2)

Sign of the Times!



the steel contract, (3) freight rate outlook, and (4) the steel ingot rate. None of these things have jelled yet.

The steel customer has enough steel to keep his plant going. He has more than enough in many cases. He is going to supplement his purchases with his inventory. This means he will take less steel

as the year rolls along. There are signs of this now. They will broaden.

Rigid labor costs today are another sobering item. They will not go down because of the strong union.

What concrete signs indicate a down trend in steel? Here they are (1) all the flamboyant boom

sparkle is out of steel, (2) customers are turning down quotas, (3) Pittsburgh and Ohio mills have solicited business in Chicago, (4) cancellations are bigger than some steel people say they are, (5) the pattern looks too much like 1937-38 to be comfortable, and (6) the drop in scrap can not be laughed off—it means something.

Sudden Changes in American Business Economies Reflected in European Thought

Paris

••• The sudden change of business climate in the United States has spread over Europe. This is perhaps an indication that European economies are more closely bound to American economy than in prewar years.

True, reconstruction and recovery problems are quite different in Europe than they are in America. But Europeans are finding much to think about in this turning of the postwar economy on both sides of the Atlantic.

As far as the civil economy is concerned there is mounting evi-

dence that some dreams of planners are turning to failure. That many problems need an entirely different approach. Although modern economists are not lacking in statistics, reports, graphs, etc., they are not in agreement as to the future. Nor are businessmen inclined to place much reliance in their prophecies.

Market research is better organized than ever before, although the task in this field has been a tremendously difficult one. It has been complicated by such abnormal factors as controlled prices and subsidies. Present signs indi-

cate that much of what has been done will need to be revised.

For the past 10 years nearly everyone has become accustomed to think in terms of tonnage, raw material supply and production. There has been little emphasis on cost or price. Now all of that has been changed.

New economic terms are appearing. Tonnage is replaced by value, raw material supply by customers' purchasing power and operating results by real margin of profit. Technical services and technicians are beginning again to be subordinated to commercial and financial services and men. Requirements are replaced by demand, needs by possibilities.

These changing trends would likely give quite a new slant to the various questionnaires sent last summer to European countries, if they had to be answered in a few weeks or months.

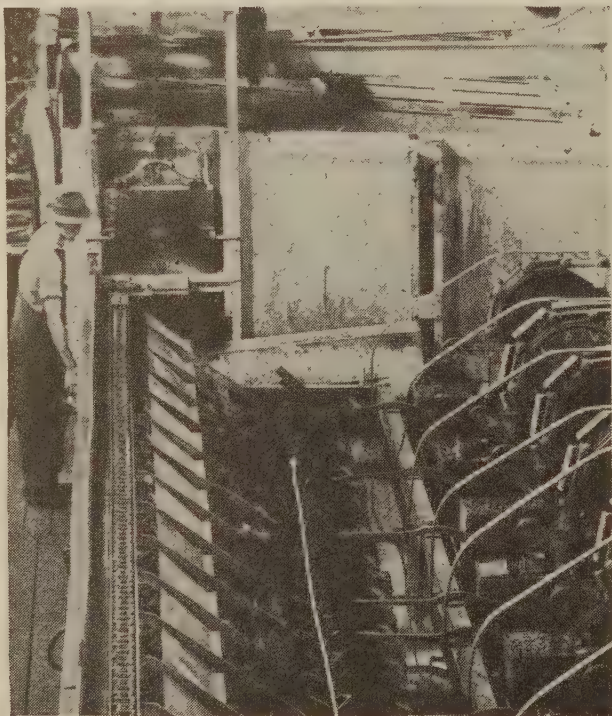
British Tractor Makers Fill Orders from Stock

London

••• Of the 4000 men who have been making Ferguson farm tractors at Coventry, 1700 have been discharged due to lack of orders. Production has fallen off rapidly because many countries can't buy for lack of sterling. This is particularly true of France and Argentina.

In other countries sales are maintained where no currency restrictions rule. Sales of tractors to British farmers are reported to be holding up well. But most makers admit that deliveries can now be made from stock. The days of long waits for tractors are gone. Payment is also reported to have slowed on tractors already sold.

SUCKER RODS:
Hardening "Oil-well" sucker rods at Oil Well Supply Co., Dallas, a U. S. Steel subsidiary. At the precise instant, the rods are plunged end-to-end into this quenching fixture. Recording pyrometers automatically govern temperature of steel and quenching bath.



Stagnant Scrap Market Shows No Signs of Renewed Activity

Philadelphia

• • • The long sustained stagnation of the scrap market is unparalleled by any period in the memory of industry members. The closest approximation was the period immediately after the end of World War I when government price controls ended and the market died due to the inability of consumers and suppliers to agree on open market prices.

One of the important causes of the present situation is the heavy tonnages of scrap that have been brought into seaboard areas from Germany and the Pacific. Imports of scrap have been very largely responsible for breaking the scrap market. But consumers in the East have so far benefited very little from current low scrap prices. They have been inactive buyers for months, placing only very small tonnages from time to time. Meanwhile they have been busily eating into their high priced inventories.

The heaviest tonnages of imports have been contracted for by the big three steel producers, Bethlehem, U. S. Steel Corp. and Republic Steel Co. Scrap consumers are naturally pleased over the impact of imports on the market. But they are saddled now with firm contracts for heavy tonnages still to come at delivered prices well over the current domestic market.

Reports in the trade indicate that delivered costs for imported scrap range from \$40 to \$45, with some tonnages costing as much as \$50. The current price of scrap at German ports, as set by JEIA, is \$28.50. To this must be added \$6 a ton for the charter ship rate, about \$2 for loading and about \$3.50 for unloading, in addition to the profit to the importing agent.

The scrap trade estimates that there are firm contracts for an additional $\frac{1}{2}$ million tons yet to come

Charles Sawyer, Secretary of Commerce, said that there was approximately 7 million tons of iron and steel scrap available in Japan, a substantial portion of which could readily be shipped to the United States.—Ed.

in from the Pacific and Germany. Imports this year have been com-

Contracts for Foreign Scrap, High Priced Inventories Reason for Weakness

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By JOHN ANTHONY
Eastern Regional Editor

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ing in at the rate of 100,000 tons a month. Imports last year, principally from the Pacific, are estimated at 200,000 to 300,000 tons. Now the trend has been reversed and the heaviest tonnages are coming from Germany.

There have been some cancellations of import tonnages. But principal mills say they are resolved to take committed tonnages, unless importers fail to keep their obligations. According to Max Lambertz of Herbert Lambertz Co., Hamburg, some 20,000 tons have been cancelled. But mills who had made a preliminary agreement for 100,000 tons failed to execute the agreement. Lambertz said that the total undelivered tonnage of German scrap contracted for by Jan. 31 was 327,000 tons. De-

liveries as of that date were 142,600 tons.

Four weeks ago, Lambertz says, the United Kingdom bought an additional 600,000 tons. The German scrap trade is aghast at the sudden drop in United States scrap prices. They find the extent of the declines hard to believe. German scrap factors are under the impression that the United Kingdom will take up any tonnage cancelled by domestic consumers. But information in this market is to the effect that the government has discontinued the subsidized buying of German scrap in the past week. Under this arrangement United Kingdom consumers were able to buy scrap from the government at \$18 a ton. The government paid the JEIA price of \$28.50, plus loading at Hamburg of \$1.82, and a handling charge of about \$2.00.

Bethlehem Steel Co. is reported by German sources to have bought 350,000 tons. Most of this tonnage is coming into Sparrows Point, where the plight of the scrap trade is most serious. Historically, the Baltimore market is devoted almost solely to shipments to the Sparrows Point mill. Dealers in eastern Pennsylvania and New York have

SOW BLOCK: Forty-five ton anvil base being reconditioned at the Sunnyvale, Calif., plant of Westinghouse Electric Corp. This block, sunk into the ground, and with an anvil mounted on top of it, is used for the drop forging of large steel billets.



Industrial Briefs . . .

• **REPRESENTATIVE** — Allmon Steel Company's Products Division, Arrott Building, Pittsburgh, has been appointed exclusive representative for the American Emery Wheel Works of Providence, R. I., in Western Pennsylvania, West Virginia and Eastern Ohio.

• **SPREADING OUT** — Pyle - National Co., Chicago, manufacturer of electrical fixtures, lighting equipment for railroads and the aviation industry, has purchased 240,000 sq ft of acreage at Kostner Ave., and Hirsch St., Chicago, for factory expansion.

• **ADDING SPACE**—Chicago Extruded Metals Co., Cicero, Ill., is adding approximately 13,000 sq ft of factory space to its present manufacturing facilities.

• **TAKES SURPLUS PLANT**—Electro-Motive Division of General Motors Corp. will purchase the government surplus plant at 103rd St. and Cottage Grove Ave., Chicago. This plant was formerly operated by Pullman-Standard Car Mfg. Co. and has been leased by Electro-Motive since December, 1946.

• **NEW PLANT**—E. H. Sargent & Co., Chicago, is planning construction of a new plant at 4705 W. Foster Ave., Chicago. Sargent, manufacturer of scientific instruments and laboratory supplies, will lease its present plant and transfer completely to the new site when construction is completed.

• **40 YEARS OLD**—Opening of a new reinforcing steel fabricating shop building marked the official celebration of the 40th anniversary of the Robberson Steel Co. on April 7. The company, formerly J. B. Klein Iron and Foundry Co., was organized in 1909. More than 500 Oklahoma City Business leaders joined company officials in dedicating the 25,000 sq ft shop building.

• **HEAD MAN**—Benjamin Schwartz, Benjamin Schwartz Co., New York, former president of the New York chapter and former director general of the Institute of Scrap Iron & Steel Inc., has been appointed chairman of the Import-Export Committee of the institute.

• **NEW POST**—Fred K. Donaldson has announced his resignation as treasurer of the Machined Steel Casting Co., Alliance, Ohio, to accept the position of executive vice-president of the Steel Founders Society of America.

• **NEW NAME, NEW HOME** — Standard Reamer & Tool Co., Detroit, will henceforth be known as Special Cutter & Tool Co. and all business, engineering and manufacturing activities have been transferred to 401 Salliotte St., Ecorse, Mich. National Distribution is being set up. The company has specialized since 1920 in manufacture of reamers, cutters and special tools.

• **TAKES OVER**—Banner Mfg. Co., Milwaukee, has been acquired by David V. Uihlein who will act in the capacity of executive director. Formerly known as Banner Products Co., the new organization plans to increase distribution and service of Banner resistance welders and brazers.

• **SOUTHERN MAN**—Paul T. Persons has been appointed Carolinas' district representative, pole line materials division, Oliver Iron & Steel Corp., Pittsburgh. Mr. Persons will make his headquarters in Charlotte, N. C., and will service North and South Carolina and eastern Tennessee.

• **NEW REP.**—F. L. Purdy Co., Columbus, Ohio, have been appointed by the Ironbound Box & Lumber Co., Hillside, N. J., who manufacture material handling equipment, as representatives for the south eastern Ohio territory.

been hit nearly as hard by the almost complete withdrawal of Bethlehem from the domestic market. Eastern Pennsylvania mills have been placing only token tonnages in the certainty that scrap prices would have to come down.

The German scrap trade has been unhappy about the lack of an escalation clause in their contracts. However, the price of German scrap had been advanced by JEIA from \$26.00 a ton. German dealers expect that an adjustable pricing basis for German scrap may go into effect in July. However, it is conceivable that developments in the domestic market may require earlier action to move German scrap tonnage.

Turkey Receives Approval For Recovery Projects

Washington

• • • Among the three basic recovery projects in Turkey approved by the Economic Cooperation Administration is the development of iron ore mines at Divrik to increase iron ore production for both internal and external use, for which \$1 million has been authorized.

Other projects approved, involving \$25.8 million of ECA funds, are the Turkish National Highway rehabilitation program, development of Zonguldak, the major Turkish coal field, and rehabilitation of the port of Zonguldak on the Black Sea.

Michigan Employment Down

Lansing

• • • During the month of February, employment in Michigan manufacturing industries dropped 2.3 pct, according to the Michigan Labor and Industry Commissioner.

Based on reports from 154 automobile and parts plants, February employment was down 3.6 pct and weekly payrolls dropped 4.6 pct.

Average weekly earnings reported by automobile plants was \$68.07. The average hourly rate was \$1.75.

During the same period 129 Michigan foundries and machine shops showed a decrease in employment of 4.3 pct. Average weekly earnings for these plants was \$62.91 and average hourly earnings reported was \$1.625.



LEAD MEETING: At the head table left to right are: R. F. Goodwin, vice-president, American Smelting & Refining Co.; Robert Ziegfeld, secretary and treasurer, Lead Industries Assn.; J. H. Schaefer, vice-president, Ethyl Corp.; George Mixter, vice-president, U. S. Smelting, Refining & Mining Co.; F. E. Wormser, vice-president, St. Joseph Lead Co.; J. A. Martino, president, National Lead Co.; Clarence Glass, vice-president, Anaconda Sales Co.; A. E. Bendalari, director, Eagle Picher Co.; J. B. Haffner, general manager, Bunker Hill and Sullivan Mining & Concentrating Co.

Fall In Lead Price To Affect 1949 Development and Exploration

Chicago

• • • The 21st Annual Meeting of the Lead Industries Assn. was held here Friday, Apr. 9, at the Drake Hotel. This is the first time in the history of the association that they have met outside New York City. About 100 producers and consumers of the vital strategic metal attended a full day of sessions which was split between the mining and smelters of lead and the consuming industry.

The board of directors reelected last year's officers of the association, who are Felix Edgar Wormser, president; K. C. Brownell, vice-president; and J. A. Martino, vice-president. George Mixter and L. E. Hanley serve along with these officers as the executive committee of the association. Mr. Wormser is president of the St. Joseph Lead Co.; Mr. Brownell is vice-president of American Smelting & Refining Co.; and Mr. Martino is president of National Lead Co.

Falling lead prices, a 6½¢ a lb drop in the last 30 days, did not dampen the enthusiasm of the members attending the meeting. The morning session, which was concerned with the lead production outlook of this country and that abroad, was well attended. The question periods were lively. R. F. Goodwin, vice-president, American Smelting & Refining Co., presented the outlook for lead out-

By D. I. BROWN
Chicago Regional Editor

o o o

put in all major foreign producing areas. Mark S. Goldsmith, president Goldsmith Bros. Smelting & Refining Co., Chicago, described the secondary lead outlook.

In the mining discussions it was emphasized that the falling price of lead would affect a curtailed development and exploration program in 1949. Also, it was the opinion of most speakers that marginal properties, and those working low grade ores, can not exist too long should the price of lead slip further. In some areas wages of miners are tied to the price of lead and one company in the mid-western area, it was reported, on Apr. 8 posted a notice that for the next 30 days their lead bonus payments would not be reduced.

Roughly labor costs have doubled or tripled since 1939, the cost of equipment in the large mechanization program carried out in 1948, was twice that of 1939, and government taxes are much higher. Mining companies reported that labor efficiency has not increased in proportion to wages. Francis Cameron, vice-president, St. Joseph Lead Co., said that approximately \$10,000 to \$12,000 of capital expenditure made by the mining

companies exist for every miner on their payrolls. Mining as a vocation, two of the speakers declared, is unpopular with labor today. Campaigns are being instituted to solicit prospective employees.

R. B. McCormick, chairman of the nonferrous branch of the Munitions Board in Washington, outlined to the members of the association the government stockpiling program.

Attending members were plainly concerned over the falling price of lead. There was some feeling by responsible executives that the decline would flatten out and stabilize in the very near future. The rapid drop in lead prices, one speaker declared, has done more to reclassify workable ores than all the geological study done in the past decade. Mr. Goldsmith, in his talk, cited the fact that secondary lead production, which 20 years ago only represented a third of all the lead used in this country, today represents over 50 pct. Thus the secondary sources are by far the largest single lead mine in the country. Mr. Goldsmith believes that due to metallurgical development more consistent tonnages of refined lead will come out of the secondary sources of supply and thus eventually serve to stabilize scrap prices. This consistent production he feels will not permit excessive hoarding or dumping as has been the practice in the past.

Zinc Price Reduction Reflected in Lower Quotations for Pipe

New York

• • • Reflecting reduction in price of zinc, U. S. Steel Export Co., U. S. Steel subsidiary, announces the following new prices with freight included to New York, Philadelphia or Baltimore.

These prices will apply on car-load lots and are effective with shipments made from the mills on and after 12:01 a. m. Apr. 6, 1949. Prices are subject to sellers' current list of extras and deductions and conditions of sale. All sales are subject to seller's prices in effect at time of shipment.

American Standard Pipe, T & C	
Buttweld, 2½" and 3"	
Galvanized	22.6%
Seamless, 3½" to 6"	
Galvanized	15.1%
English Gas Tubes, T & C	
Buttweld, 2½" and 3"	
Galvanized	24.5%

Reynolds Buys Michigan Aluminum Plant from WAA

Washington

• • • War Assets Administration has announced the sale of the surplus government-owned Extruded Metals, Inc., aluminum plant at Grand Rapids, Mich., to the Reynolds Metals Co.

The sale price was \$1,500,000, of which \$500,000 is to be paid down and the balance in 10 years, with

interest at 4 pct per annum. Fair value of the property had been put at \$2,100,000.

The Reynolds Metals Co. had been operating the plant since June 1, 1946 under a 5-year lease with an option to lease for an additional 2 years.

Located on some 39 acres of land, the plant includes buildings, machinery and equipment. It was built during World War II and designed for the production of high strength aluminum rod, bar, shapes and tubing. The plant's rated capacity is 10,800,000 lb of aluminum.

The sale will be reviewed by the Dept. of Justice in the light of anti-trust laws.

Princeton Economist Dies

Princeton, N. J.

• • • Frank Albert Fetter, professor emeritus of political economy, Princeton University, passed away Mar. 21. The 81-year-old professor devoted much of his lifetime to the cause of f.o.b. mill. His book, "The Masquerade of Monopoly," published in 1932, is considered by legal experts to be the blueprint by which multiple basing points were eventually abolished. The professor's last published effort in the half century struggle he has waged both on and behind the scenes, was "Exit Basing Point Pricing" printed in the *American Economic Review*, December, 1948.

New Low Cost Oxygen Plant Passes Test Run

Cleveland

• • • A low cost oxygen plant of commercially substantial tonnage output, to be built for the petrochemical industries, has successfully passed all initial test runs, according to Eric A. Flaschar, general manager, Stacey-Dresser Engineering Div., Dresser Industries, Inc.

The new oxygen unit, which is installed in Winshire, Tex. as an integral part of a petro-chemical plant recently completed by McCarthy Chemical Co., is now producing more than the design quantity of 175 tons (4,200,000 cu ft) per day of 93 to 95 pct pure oxygen which is delivered at 800 psi gage.

A feature of this process is a low-pressure, self-contained cycle, a far-reaching improvement over the original German process which required up to 10 pct high pressure chemically purified air.

The new system requires no chemicals, using only cooling water and a source of fuel gas. Air is compressed to 85 lb, cooled by expansion and self-refrigeration, and the CO₂ and other impurities removed by depositing them on special aluminum fin-tube exchangers, separating the oxygen from the nitrogen in Stacey-Dresser aluminum fractionating columns.

Bower Roller Bearing Net Up

Detroit

• • • Bower Roller Bearing Co. earned a profit in 1948 of \$2,986,-830 or \$6.64 a share.

According to S. A. Strickland, president, the company earned \$6.08 a share in 1947. Bower improved its operating ratio to 3.81 to 1 from a ratio of 3.26 to 1 a year ago, Strickland said.

Aluminum Needs Examined

Chicago

• • • Donald L. Colwell, sales engineer of the Apex Smelting Co., has returned from abroad. He and Albert Butler, of Denver, were sent to six European countries by the Economic Cooperation Administration to examine the aluminum requirements of Europe.

Coming Events

Apr. 18-20	Midwest Power Conference, Chicago.
Apr. 18-20	American Institute of Mining and Metallurgical Engineers, annual conference of Openhearth Steel Committee, Chicago.
Apr. 19-20	Magnesium Assn., annual meeting, Chicago.
Apr. 22-23	American Institute of Mining & Metallurgical Engineers, New England regional meeting, Springfield, Mass.
Apr. 25-26	American Supply & Machinery Manufacturers Assn., Triple Mill Supply convention, Cleveland.
May 2-3	Assn. of Iron & Steel Engineers, annual conference, Baltimore.
May 2-4	American Society of Mechanical Engineers, spring meeting, New London, Conn.
May 2-5	American Foundrymen's Society, annual convention, St. Louis.
May 4-7	Electrochemical Society, semiannual meeting, Philadelphia.
May 5-6	American Society for Quality Control, annual convention, Boston.
May 5-6	Rail Steel Bar Assn., annual meeting, Chicago.
May 11-13	National Welding Supply Assn., annual convention, Cincinnati.

Warehousemen See Better Inventories But Drooping Sales Volume

Cleveland

•••Second and third quarter outlook for steel warehouses is rapidly shaping up to comfortable inventories of most steel products and a 10 pct drop in sales volume.

Proving that the dew is off the steel distributors' daisy, inventories at the present time are the best since 1941, and prospects for replacement are unlimited.

Also, demand for alloy, cold finished bars, stainless and tubing is soft and more than sentimental consideration is being given to the reduction of the spread on some of these items by distributors as a sales stimulant. Some warehouses that handle fabrication work have cut the price on structurals, according to reports.

These conditions are not confined exclusively to the Cleveland area, but are general throughout the country.

Steel warehouse supply problems have been easing during the past 8 weeks, but, as operators point out, "demand for steel is not as soft as some purchasing agents, thinking of price cuts, would like to make you think."

Generally, but depending to some extent on the source of supply, distributors can get all the alloy, tubing, stainless and cold finished they want. Structurals and plates have eased, although heavy plates are tighter than light; cold rolled sheets have softened up considerably, and galvanized has eased.

On the other hand, some hot-rolled bars sources are quoting distributors June and July delivery and flats for August and September, and some distributors point out that they still cannot go into a mill and buy well rounded stocks. They add that if they could get well-rounded stocks, the warehouse business would be as good as ever.

Tight spots are hot-rolled bars, hot-rolled sheets, and some structurals, but here again, source of supply is a factor.

Like mill customers, warehouse customers are cost conscious, a new mental attitude for many, but one which has prompted their re-

Outlook Is Best for Firms With Prewar Records of Service to Customers

By BILL LLOYD
Cleveland Regional Editor

turn to the regular channels of trade.

Steel distributors are well aware that mid-summer is going to see some keen competition. The day of the 25-ton to 50-ton order is over, as is stock turnover seven or eight times a year. Sales volume is down, and like many other businesses, costs of selling are up.

Return to competitive selling means big stocks for the warehouse operators, for the 500-lb to

1000-lb order is back to stay, and the 3-ton to 5-ton order may soon be big stuff, which leads some distributors to believe that perhaps the present spread isn't big enough.

Among the unhappier aspects of the steel warehouse business at the moment are the following developments:

A certain number of manufacturers in every industrial area in the country have more steel than they can use at the present time, and fearful of an upturn, are maintaining mill quotas and selling off their surplus steel, at a loss in some cases.

Customers that were used to getting five-ton and 10-ton orders from warehouses during the war, because mills couldn't take care of them, are now going to mills and getting the tonnage, this is being felt most by warehouses started

Steel Products	Number of companies	Items	Current Month				To Date This Year			
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Reuse)		Shipments to Members of the Industry for Conversion into Further Finished Products or For Reuse		Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Reuse)		Shipments to Members of the Industry for Conversion into Further Finished Products or For Reuse	
			(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments	(Net Tons)	Per cent of Total Shipments
Ingot, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	308,149	5.6	259,774	5.5	618,827	5.5	552,729	5.5
Skelp	6	2	6,523	0.1	42,929	0.1	11,456	0.1	88,565	0.1
Wire rods	19	3	54,129	1.0	23,665	1.0	108,372	1.0	46,907	1.0
Structural shapes (heavy)	11	4	358,616	6.5	2,851	6.5	716,945	6.3	4,917	6.3
Steel piling	3	5	21,274	0.4	924	0.4	47,456	0.4	924	0.4
Plates	28	6	589,572	10.7	21,769	10.6	1,197,863	10.6	51,084	10.6
Rails—Standard (over 60 lbs.)	4	7	161,614	2.9	2,048	2.9	328,834	2.9	2,409	2.9
Rails—All other	5	8	17,024	0.3	48	0.3	30,687	0.3	142	0.3
Joint bars	7	9	12,205	0.2	2,968	0.2	24,446	0.2	5,287	0.2
Tie plates	6	10	38,522	0.7	-	0.7	77,714	0.7	41	0.7
Track spikes	8	11	10,598	0.2	35	0.2	23,673	0.2	35	0.2
Wheels (rolled or forged)	5	12	27,494	0.5	113	0.5	57,299	0.5	199	0.5
Axles	5	13	19,301	0.4	3	0.4	38,863	0.4	7	0.4
Hot rolled bars (including light shapes)	39	14	654,936	11.9	62,921	11.9	1,351,862	12.0	137,701	12.0
Hot rolled bars—Reinforcing	23	15	133,239	2.4	249	2.4	276,099	2.4	1,138	2.4
Cold finished bars	33	16	138,217	2.5	1,094	2.5	286,626	2.5	3,325	2.5
Tool steel bars	17	17	5,905	0.1	87	0.1	12,528	0.1	205	0.1
Pipe—Standard	16	18	184,730	3.3	3,946	3.3	373,611	3.3	9,420	3.3
Pipe—Line	12	19	178,582	3.2	1,904	3.2	368,264	3.3	4,569	3.2
Pipe—Oil country goods	14	20	115,862	2.1	7,572	2.1	239,614	2.1	16,409	2.1
Tubes—Boiler	3	21	9,566	0.2	825	0.2	19,663	0.2	2,397	0.2
Tubes—Mechanical and pressure	21	22	71,283	1.3	2,151	1.3	145,371	1.3	4,761	1.3
Miscellaneous pipe (including conduit)	11	23	23,811	0.4	158	0.4	48,773	0.4	718	0.4
Wire—Drawn	37	24	216,342	3.9	13,624	3.9	452,223	4.0	28,940	3.9
Wire—Nails and staples	17	25	72,496	1.3	1,125	1.3	147,555	1.3	2,310	1.3
Wire—Barbed and twisted	14	26	22,324	0.4	11	0.4	44,475	0.4	15	0.4
Wire—Woven wire fence	12	27	34,834	0.6	273	0.6	69,345	0.6	669	0.6
Wire—Bale ties	11	28	4,328	0.1	-	0.1	10,436	0.1	-	0.1
Black plate	10	29	66,702	1.2	-	1.2	134,838	1.2	-	1.2
Tin andterne plate—Hot dipped	8	30	142,204	2.6	-	2.6	282,564	2.5	10	2.6
Tin plate—Electrolytic	10	31	157,766	2.9	-	2.9	316,426	2.8	42	2.9
Sheets—Hot rolled	15	32	606,663	11.0	51,148	11.0	1,239,390	11.0	121,748	11.0
Sheets—Cold rolled	12	33	552,958	10.0	1,123	10.0	1,156,651	10.2	2,915	10.2
Sheets—Galvanized	13	34	130,686	2.4	12	2.4	271,686	2.4	169	2.4
Sheets—Long term	8	35	13,653	0.2	136	0.2	25,962	0.2	227	0.2
Sheets—Enameling	7	36	19,530	0.4	207	0.4	42,877	0.4	297	0.4
Sheets—Electrical	11	37	41,084	0.7	-	0.7	89,799	0.8	-	0.7
Strip—Hot rolled	22	38	146,220	2.7	22,296	2.7	300,768	2.7	53,580	2.7
Strip—Cold rolled	34	39	150,069	2.7	1,923	2.7	315,962	2.8	3,896	2.8
All other	2	40	947	-	-	-	2,567	-	-	-
Total steel products	138	41	5,519,938	100.0	529,912	100.0	11,298,570	100.0	1,147,750	100.0

During 1947 the companies included above represented 99.5 % of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

during the war, and immediately following. Many of these warehouse operators know nothing about the operation of a warehouse in a competitive market, and there are rumors already of warehouse failures in such areas as Chicago and Pittsburgh. Estimates of the increase in the number of steel warehouses during the period 1941-1948 run from 15 pct to 25 pct. The day when the mill and the warehouse will both be chasing the same customer down the street is not far off.

Receives Approval For Pipe Line Construction

New York

• • • Construction work on Texas Eastern Transmission Corp.'s new expansion program, designed to increase the capacity of its natural gas pipe line system to 740 million cu ft a day, will begin immediately, according to R. H. Hargrove, president of the company. His announcement followed receipt of the Federal Power Commission's order granting a certificate of public convenience and necessity for the new project.

Texas Eastern will lay 177.5 miles of 26-in. diam pipe line looping the two existing "Inch" lines from the company's Station No. 16,

near Lebanon, Ohio, to a point approximately 20 miles east of Station No. 19, which is near Summerfield, Ohio.

At the same time, Mr. Hargrove added, 69.5 miles of 20-in. pipe line will be built looping two sections of the Little Big Inch in Texas and Louisiana; and 100 miles of 16-in. line will be laid from the Provident City field in Lavaca County, Tex., to the Baytown, Tex., terminus of the Little Big Inch.

Right-of-way has been acquired for the pipeline projects in Ohio, Texas and Louisiana according to Hargrove. A total of 14,000 tons of 26-in. and 20-in. pipe has already been delivered and distributed at various points along the route. The entire program will require 62,000 tons of steel pipe, 14 new 1000 and 1100-hp gas engines and reciprocating compressor units, and 15 centrifugal compressors with electric motors ranging from 1250 to 2000 hp. Total cost is estimated at \$24,052,000.

Plans Plant Expansion

Grand Rapids

• • • Doehler-Jarvis Corp. is planning a new diecasting plant here that will cost "at least" \$1 million.

This was recently revealed by H. H. Doehler, chairman of the board.

Steel Supply Co. Stocks Aluminum Mill Products

Chicago

• • • United States Steel Supply Co., recently announced that they are stocking a full line of aluminum products. Reynolds Metal will supply U. S. Steel Supply Co.'s 14 warehouses located throughout the country.

The stocking program of aluminum in U. S. Steel Supply warehouses has been going on since last fall. It is now complete and Leslie B. Worthington, president of the company said, "The distribution of aluminum by our company is evidence of our desire to satisfy more fully the metal requirements of our customers." Donald F. Stone, manager of the company's newly created aluminum sales division, said that for the present aluminum mill products such as structurals, bars and sheets will be stocked only at the firm's Los Angeles, San Francisco and Chicago warehouses.

Receives Safety Plaque

Youngstown

• • • Steam and power division, Youngstown Sheet & Tube Co., has been awarded its second plaque in recognition of a million man-hours worked without a lost time accident. In 1943 the division chalked up a similar record.

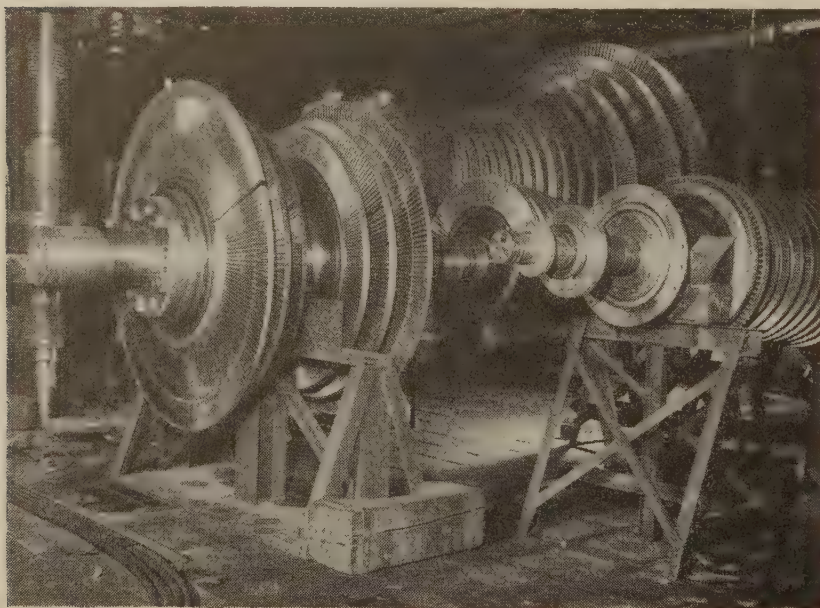
H. E. Englebaugh, manager of Youngstown district properties of Youngstown Sheet & Tube Co., presented the plaque to A. L. Wilhoite, superintendent of the department, in the presence of several department employees. This is the fourth department in the Youngstown district to repeat its million-man-hour safety record.

Sets 2 Plant Records

Middletown, Ohio

• • • Armco Steel Corp.'s East Works plant, employing 4500 men and women, worked the entire month of March without a lost-time accident, and at the same time set a new record for monthly shipments. The safety record represented more than a million man-hours. Last year the plant had a very low accident frequency rate of 2.5, and 2 months of the year were without major accidents.

POWER: These turbine-generators, shown under construction at the General Electric turbine plant at Schenectady, N. Y., will eventually provide power for the eastern seaboard. Workmen are checking precision work on the rotors prior to assembly of the machines for a test run. Combined capacity is 180,000 kw, enough for nearly half a million people, according to G-E engineers.





Dr. R. D. Mears

Corrosion Engineers Discuss Problems, Elect Officers



F. L. LaQue

Cincinnati

• • • The National Assn. of Corrosion Engineers Annual Conference was held here on April 11 through Apr. 14. About 900 men attended the conference and visited the 55 exhibition booths run in connection with the conference which was held at the Netherlands Plaza Hotel.

New officers installed for the coming year were Dr. R. D. Mears, president, and Mr. Vance N. Jenkins, vice-president. Mr. O. C. Mudd was re-elected treasurer and Mr. A. B. Campbell continues as secretary of the association.

Dr. Mears is manager of the Corrosion Research Laboratory of the Carnegie Illinois Steel Co. in Pittsburgh. Mr. Jenkins is Research Chemist for the Union Oil Co. of California and Mr. Mudd is the Senior Corrosion Engineer of the Shell Pipe Line Corp. at Houston, Texas. Three directors of N.A.C.E. were also appointed: Dr. Paul W. Bachman, who is Manager of the Technical Development Div. of the Commercial Solvent Corp.; Ellis D. Verink, Jr., head of the Chemical Section Development Div. of the Aluminum Co. of America, and Bean C. Glass of the Pure Transportation Co. of Chicago.

At the meeting Dr. Mears was presented with the Scientific Award of the association; called the Whitney Award. F. L. LaQue, president of the International Nickel Co., and last year's president of N.A.C.E., received the Speller Award. These awards are presented annually in recognition of outstanding achievements or contributions made in the corrosion field.

Twenty papers were presented

at the technical sessions. The papers ranged from highly technical approaches to the problem of corrosion of metals at high temperatures to practical operating problems like the "Preparation of Pipe Surfaces for Bitumen Coating During Reconditioning."

N.A.C.E. is concerned with all types of corrosion in all types of metals in practically every industry. Kempton H. Roll of the Lead Industries Assn, presented a paper, "Physical and Corrosion Characteristics of Lead in the Chemical Industries." Considerable interest was shown in the paper presented by J. L. Basil and W. C. Stewart of the U. S. Naval Engineering Experimental Station of Annapolis, Maryland.

The investigators presented preliminary results obtained in the study of the corrosion resistance of aluminum alloy. Six sand cast aluminum compositions and seven wrought grades of aluminum were tested. The tests were carried out in conjunction with International Nickel Co. and Dow Chemical Co. The alloys were tested in sea water, brackish river water and fresh water.

Three types of testing apparatus were employed:

- (1) Rotating disk corrosion-erosion apparatus
- (2) Circular path equipment
- (3) Aspirator type yet impingement apparatus.

The authors summarized by telling the association that results indicate most of the alloys tested would not be suitable for continuous exposure in sea water, especially when the water is turbulent. The purpose of their investigation was to determine if the use of aluminum alloys could be ex-

tended to include sea water piping systems and equipment using sea water aboard ship.

Corrosion-erosion damage was severe in all tests, except those taken in fresh water. Damage was greater in shallow sea water than in deep sea water. However, temperatures of shallow water tests were 10 to 20 degrees F higher than those in deep water. The authors believe the greater corrosion damage in shallow water is not due to the greater number of entrained air bubbles in the shallow water alone.

Corrosion damage generally was greater in sea water than in brackish water, but a similar type of attack took place in both media. Fresh water corrosion damage was slight on all samples tested.

Reports of corrosive attack on various metal installations were presented in detail at the different meetings, all of which were unusually well attended by the members and guests at the conference.

Offers Foreign Scrap Iron

New York

• • • The Japanese Board of Trade recently announced requests for sealed bids on four separate lots of Japanese Government owned subject items as follows:

Lot 1—9000 metric tons (5 pct more or less) alloy steel, armor plate and demilitarized gun barrels.

Lot 2—7700 metric tons (5 pct more or less) alloy steel ingots and billets.

Lot 3—3650 metric tons (5 pct more or less) alloy steel ingots.

Lot 4—13,400 metric tons (5 pct more or less) assorted alloy steel scrap, alloy steel ingots, and demilitarized gun barrels.

Total approximate weight 33,337 metric tons.

Bidding closes noon Tokyo time, May 10, 1949. Bids will be available at the SCAP Foreign Trade New York Office, 292 Madison Ave., New York 17, N. Y.

Opens Branch Warehouse

Cleveland

• • • Ohio Stainless & Commercial Steel Co., Cleveland, has established a branch warehouse in Detroit. The new facility will be operated at 6970 West Jefferson Ave. and will operate as the OSCO Steel Div.

Italian Steelmakers Aim at Modern Plant, Competitive Prices

New York

• • • If Finsider's plan for "Reorganization of the Italian Iron and Steel Industry" is carried through successfully, history will record it as one of the brightest spots in the industrial progress of that country. If the plan is not successful the painful experiences of steel, and other industries depending on steel, following the first world war will probably be repeated.

Finsider's plan is relatively complex. It is based on exhaustive studies of production and consumption of steel in the world and in Italy. In addition to plant and equipment, it includes such items as labor, raw materials, prices, logistics, economic theory, etc. All of these items are of great importance. But the success or failure of the plan will probably hinge on two main points: (1) Modernization of plant and equipment and (2) costs of finished iron and steel products.

Bulk of the modernization is slated to be carried out within the framework of the Marshall Plan. Reorganization of the industry is scheduled to be completed by 1952 or 1953. The Finsider plan has already been submitted to the Italian Government and ECA. The equipment features of the modernization plan have been ap-

Integrated Plants Slated To Play Important Role In Future of Industry

• • •

By BILL PACKARD
Ass't News-Markets Editor

• • •

proved, although there is still some disagreement as to which plants should get the equipment. Discussions are continuing as to whether two or all three of the integrated plants are to be fully renovated.

These three plants are: Bagnoli (Naples), Cornigliano (Genoa) and Piombino, also on the West Coast between the other two. These plants suffered severe war damage and have been only partially restored. Their repair and completion constitute a large share of Finsider's estimated expenditures for reorganization of the group.

Considerable progress has already been made in restoring two of these plants. Most of the damage to the Bagnoli plant has been repaired. Two blast furnaces, one openhearth and some mills are in operation.

In the Piombino plant recon-

struction work is not so far along, especially on the blast furnaces. But the old steel department and rolling mills are operating. These two plants seem certain to be restored to a position better than they originally held.

At Cornigliano it is a different story. No important reconstruction has taken place. During the war the Germans planned to remove this plant, lock, stock and barrel, and rebuild it in Germany. They disassembled and carted off to Germany all machinery and movable structures, totaling about 45,000 tons. About 80 to 85 pct of this material has since been located and a good portion of it recovered.

Of the three plants this one must be rated as doubtful—at least until such time as Finsider is able to gain approval for its re-equipment. As far as this reporter could determine no one is betting that that won't happen. Most cogent argument in favor of this plant is that it utilizes Genoa harbor which is among the best.

Most important new rolling mill equipment will consist of: A continuous mill for 25x25 mm billets with capacity of 120 tons per hour, and a semicontinuous mill for wide strip, sheet and plates with

History of Italian Steel Industry—Controversy and High Prices

New York

• • • Historically, the Italian iron and steel industry has been composed of numerous, small, nonintegrated plants. These plants have always operated with a solid charge, which has consisted mainly of scrap, much of which was imported.

This widely divergent group, of which there are about 80 separate plants, produce a variety of rather specialized products. They have exploited Italy's abundance of highly-skilled, low-cost labor.

During the period between the two world wars a group called Finsider gained control of about half the industry. Finsider was a semi-official group, patterned somewhat along the lines of the Reconstruction Finance Corp. in this country.

Finsider's aims were far different from those of the historic producers. Chief point of difference was on the question of whether or not the Italian industry should become fully integrated. During the '30's Finsider built three large integrated steel plants on the West Coast. The high point of the industry was reached in 1942.

The end of the war found the three integrated plants severely damaged, and the future of Finsider, consequently, uncertain. The differences between Finsider and the numerous nonintegrated producers flared anew. There were a multitude of complex political and economic problems which needed to be answered before the nature of the reconstruction of the Italian iron and steel industry could be determined.

Biggest question of all was still whether or not the industry should be integrated. (This controversy was discussed at length in THE IRON AGE, Aug. 29, 1946, p. 76.) Present indications are that neither group will triumph completely. But that they will be bound together by the common aim of making the Italian industry modern and competitive.

Finsider's aims were presented to the Italian government and ECA in the form of a plan called "Reorganization of the Italian Iron and Steel Industry." This source has been drawn on freely in the accompanying remarks, although other sources have also been included. For a full discussion of raw materials and logistics of the industry in Italy see THE IRON AGE, Oct. 10, 1946, p. 121-A.

capacity of 100 tons per hour. As presently outlined the production of these three plants will be as follows:

Bagnoli will be chiefly devoted to commercial mass production of wire rods, reinforcing bars and shapes. It will also supply other plants with billets.

Piombino will continue producing rails, railway materials and various shapes. It will also supply ingots and blooms to other Italian plants for further processing into specialized products.

Cornigliano, it is planned, will have only the semicontinuous mill for wide strip and thin sheets. A large portion of the hot-rolled strip will be supplied to other plants to be further fabricated into thin sheets and tinplate. It will also supply slabs to other plants.

The extent to which the Finsider plan has already been approved assures that these plants will play a dominant role in the future Italian steel industry. The postwar tightness of world scrap markets have lent strength to the Finsider arguments. Of course, ore and coke have been in tight supply too. But they point out that while there is always opportunity for greater exploitation of mines, the generation and collection of scrap has more definite limits.

But this does not mean that the nonintegrated plants will be eliminated. Far from it. Total output of the industry is planned for 3 million tons in 1952 or '53 (3.5 to 4 million after that). Of this amount Finsider, including integrated and nonintegrated plants, would produce 1.8 million tons. Other nonintegrated plants would produce 1.2 million tons.

Finsider admits a moral obligation: (1) To take into account all national interests and (2) to interfere as little as possible in the situation of other plants. In 1948 Finsider's share of steel output from scrap was 44 pct of the national total. As soon as increasing hot-charge production will permit they plan to lower their scrap-process output to 23 pct.

Finsider also promises to supply other firms with pig iron. In addition they expect to furnish semifinished products such as blooms, billets, slabs and hot-rolled strip which will increase

the other firms' output of finished steel products.

Some of the nonintegrated plants of the Finsider group will halt or reduce their steelmaking operations through the use of scrap. These plants would then draw supplies of semifinished steel from the integrated plants. Should scrap become plentiful these plants would be allowed to increase their steel output, provided their costs were not far higher than those of the integrated plants.

In general the integrated plants and the larger nonintegrated plants will concentrate on products which lend themselves to rapid mass production. The aim is to take advantage of equipment and machinery which has high capacity, but which must be operated at high speed to achieve competitive costs. This would leave open to the smaller nonintegrated firms the high-quality, specialty items and nonstandard products. These include more than half of total consumption.

Effective demand for steel depends largely upon its price. Yet steel prices in Italy have usually been among the highest in the world. Finsider knows this. They hope to do something about it. Their aim is to build a steel industry whose products will be competitive with those of other countries—without the protection of cartels or tariffs. This has never been done in Italy.

Present prices would have to be reduced 35 to 60 pct to make them competitive with international prices. But Italy doesn't plan to enter the export market on a big scale. Exports will mostly be to countries in the Mediter-

Plan of Italian Steel Production—1952

Type Steel	Quantity (metric tons)	Charge (lb for metric ton of steel)		Requirement (metric tons)	
		Scrap	Pig Iron	Scrap	Pig Iron
Electric.....	540,000	2,270	110	556,000	27,000
Duplex Bessemer electric.....	80,000	970	1,540	27,000	42,000
Openhearth, solid charge.....	950,000	1,720	660	741,000	285,000
Openhearth, liquid charge.....	930,000	730	1,470	305,000	625,000
Basic Bessemer.....	520,000	130	2,340	31,000	551,000
Total steel.....	3,000,000			1,680,000	1,530,000
Pig iron requirement for foundry....					250,000
Total pig iron requirement.....					1,780,000

The Pig Iron Production Plan

Description	Tons per Year
Electric pig iron.....	250,000
Cogne and Servola pig iron.....	200,000
Integrated plants pig iron.....	1,330,000
Total.....	1,780,000

anean basin and the Middle East. The accompanying table shows percentage reduction of prices which Finsider hopes to achieve for its products. These prices are lower than cif Italy prices of imported iron and steel products.

Finsider's Future Price Reductions

Products	Pct Price Reduction	
	Basic Bessemer	Open-hearth
Pig iron.....		43
Steel.....	24	35
Blooms and slabs.....	32	40
Billets.....	34	45
Rails.....		44
Bars and shapes.....	31	38
Wire rod.....	40	45
Concrete reinf. bars.....	36	42
Plates.....		43
H-R sheet and strip.....		58
Tin plate.....		52

There is little question that competitive iron and steel prices would prove an enormous stimulant to mechanical industries in Italy. In the past they have suffered greatly from prohibitive iron and steel prices resulting from cartel policies carried out under protective tariffs. They have found it impossible to compete with foreign industries which had to pay but little more than half as much for their iron and steel products.

A good portion of Finsider's

Crude Steel Production—Western Europe (000 metric tons)

Country	1938	1952/53
United Kingdom.....	10,564	17,400
France, Saar.....	8,759	14,500
Benelux.....	3,772	8,675
Italy.....	2,328	3,000
Sweden.....	995	1,950
Austria.....	666	900
Norway.....	45	100

plans are modeled after the steel industry in the United States. This is especially true of their plans for production of hot and cold strip and tinplate. They cite low prices, high production and vast expansion of the mechanical industries in America resulting from these technological innovations. They believe the same thing can be done in Italy. Time will tell.

Reports Record Sales

Philadelphia

• • • Net sales of Alan Wood Steel Co. for the year ended Dec. 31, 1948, were \$47,480,574, the largest in the company's history, according to the company's annual report recently issued. The volume reported represents an increase of \$11,508,913 over 1947 sales of \$35,971,661.

Net income after all charges including taxes was \$4,116,444, equal after preferred dividends to \$7.78 per share on the 483,767 shares of common stock outstanding, compared with \$1,955,446, or \$7.26 per share, on the 200,000 shares of common stock outstanding Dec. 31, 1947.

National Tube Sets Records

Pittsburgh

• • • Four major all-time company production and shipping records and many unit records were broken by the plants of National Tube Co. during March, according to John E. Goble, president.

Principal records of the company's plants were in production of blast furnace, iron, steel ingots (openhearth and Bessemer) and semi-finished steel from the blooming mills. A new high figure for total finished tubular products shipped also was set.

Tonnages were 266,443 tons of pig iron, 286,328 tons of ingots, 238,782 tons of semi-finished steel rolled in the blooming mills and 201,020 tons of finished tubular products shipped.

Estimates Japanese Potential Scrap At 7 Million Tons; 5 to 6-Year Supply

Washington

• • • With an estimated potential scrap supply in Japan of some 7 million tons, a Commerce Dept. sponsored scrap mission last week recommended to Commerce Secretary Charles Sawyer that steps be taken to ship at least a portion of this amount to the United States.

In addition to 5,102,000 tons of actual scrap, the mission estimated that supplies of potential scrap amount to between 1 million to 2 million tons, bringing the total amount of scrap available in Japan to between 6 million and 7 million tons. The report defines potential scrap as scrap obtainable from sunken ships, bombed and damaged structures, machinery and equipment not suitable for reuse, and ingots and billets of undetermined analysis.

The figures arrived at in the mission's estimates are more than double those given in a report by the Japanese Government's Ministry of Commerce and Industry on all actual and potential iron and steel scrap in Japan as of Aug. 15, 1948. The Japanese figures were said to include all owners in Japan of one ton or more of ferrous scrap. They indicated an actual tonnage of approximately 2,400,000 tons and a potential scrap tonnage of 900,000 tons, or a total of 3,330,000 tons of scrap.

The report contains the following conclusions and recommendations:

(1) Based on the figures previously given there exists in Japan a scrap supply of from 5 to 6 years. Scrap is in considerable surplus in Japan.

(2) The exportation of a tonnage of suitable openhearth scrap is practical and such material should be made available for export to the United States wherever and whenever needed. Such exportation will not impair the domestic economy of Japan in the fulfillment of its foreseeable steel production goal.

(3) Very little effort was noted on the part of scrap consumers to utilize any consider-

able tonnage of pit scrap, turnings, sheet scrap or unprepared materials in inventories requiring further segregation and processing. This results in waste, and a program of utilizing such grades of scrap should be immediately effected.

(4) The prevalent lack of scrap processing equipment is a potential threat to the future attainment of Japan's steel production goals. Equipment such as shears, presses, cutting equipment and necessary gases, and breaking equipment for cast iron scrap and pit scrap should be imported from the United States in partial payment for exports of iron and steel scrap.

(5) The mission concurred in the opinion of many producers that scrap cannot be profitably segregated, prepared, and transported at the current market price of approximately \$10 per ton in American dollars. It recommended as an incentive to producers a revaluation and increase of existing domestic ferrous scrap prices for domestic as well as export markets.

(6) The mission also recommended that limitations be immediately effected on operating supplies in the scrap inventories of steel producers and that consumers with more than 6 months supply of scrap be prohibited from purchasing or receiving additional scrap tonnages.

Comprehensive on-the-spot inventories of actual tonnages of scrap were made at iron and steel plants, scrap dealers yards, arsenals, shipwrecking and shipbuilding operations and government preparation yards in the Tokyo-Yokohama district, Osaka-Kobe district, Yawata-Kokura district, Sasebo, Nagasaki, Kure and adjacent islands and Nagoya. The mission also made checks and inspections at the largest steel mills, dealers yards, shipwrecking plants, arsenals and other producers on the islands of Honshu and Kyushu.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

14,000 Tons, Pittsburgh, Mellon U. S. Steel Building, to American Bridge Co., Pittsburgh.

175 Tons, Chicago, American Railway Research building for Illinois Institute of Technology, to Wendnagel & Co., Chicago.

• • • Fabricated steel inquiries this week included the following:

5000 Tons, Philadelphia, Pier 80, City of Philadelphia, bids extended to Apr. 21.

2200 Tons, Pittsburgh, Buildings No. 1 and No. 2 for the Pennsylvania Railroad.

2200 Tons, Island Heights, N. J., bridge, State of Pa., Ole Hansen, Pleasantville, N. Y., low bidder.

440 Tons, Lebanon-Lancaster Counties, Pa., Pa. Turnpike bridge, due Apr. 26.

• • • Reinforcing bar awards this week included the following:

1300 Tons, Irwin, Pa., Fischer Body Building through Ragnor Benson Co., Chicago, to Carnegie-Illinois Steel Corp., Pittsburgh.

350 Tons, Danville, Pa., Danville State Hospital admission building, to S. H. Evert Co., Bloomsburg, Pa.

325 Tons, Chicago, Apartment building, 1350 Astor St., through Kollie Foracker Co., Chicago, to J. T. Ryerson & Sons, Chicago.

300 Tons, Birmingham, City Hall for the City of Birmingham, to Joseph H. Fox & Co., Birmingham.

300 Tons, Fredericksburg, Va., American Viscose Corp. plant expansion, to Hughes Foulkrod Co., Philadelphia.

120 Tons, Philadelphia, reconstruction of South St. bridge, to Robert E. Lamb & Sons, Inc., Philadelphia.

• • • Reinforcing bar inquiries this week included the following:

2000 Tons, Washington, D. C., Federal Courthouse, due May 4.

500 Tons, Philadelphia, Pier 80 South, City of Philadelphia, due Apr. 21.

500 Tons, Illinois and Iowa, television towers for American Telephone & Telegraph Co., McDonald Engineering Co., Chicago, Contractors.

250 Tons, Chambersburg, Pa., State Hospital, due Apr. 20.

• • • Railroad car awards and inquiries this week included the following:

National Railway of Mexico is inquiring for 1000 50-ton box cars and 500 40-ton stock cars. The Chicago, Illinois & Midland Railway has deferred an order of 150 hopper cars. They may repair present cars instead of buying new ones.

J & L Announces New Free Machining Steel

Pittsburgh

• • • Tests on a new free machining bessemer steel just introduced by Jones & Laughlin Steel Corp. show a machinability index 25 pct higher than standard B-1113 steel. Using 6178 tons in test and production runs, some 45 machine shops reported either substantial production increases or increased

tool life or both. Better cold working and forming properties are also claimed.

Called "E" steel, the new J & L product sells for \$3 a ton above the standard chemistry extras. Part of the explanation for the higher machinability index, without sacrifice in physical properties, is appreciable lower carbon than the standard bessemer screw steels. A somewhat unusual concept of machinability and metallurgy is said to be involved in the new product. The "E" steels are now being sold in cold finished bars and are available in hot rolled stock.

One nut manufacturer reported

a 15 pct increase in production while another doubled tool life while boosting hourly output from an average of 1607 to 1832 pieces. Several shops reported doubled tool life at comparable speeds.

Places Aluminum Order

Olympia, Wash.

• • • The 225 tons of aluminum needed to make the 1 million Washington State 1950 license plates has been ordered from the Permanente Metals Corp. of Spokane at a cost of \$132,740.

This will be the last plate-making effort of the state for 2 years. In 1951 only tabs with the year will be issued and these will be clamped on to the 1950 plates.

50 YEARS AGO

THE IRON AGE, April 13, 1899

• "Marconi's system of wireless telegraphy, which has been attracting much attention in Europe, scored a distinct success this week in some tests that were made across the English Channel. Messages were passed with greatest ease between a station at Wimereax, near Boulogne on the coast of France and the South Foreland Light House on the English coast, a distance of 32 miles."

• "The State of Delaware is now prepared to compete with N. J. or the business of incorporating the many big new companies now being launched."

• "Nowhere have the magnetic instruments been employed in prospecting for iron ore as long and so extensively as in Sweden, and in no other country have these instruments reached such perfection. Sometimes this has been accounted for by assumption that most of the Swedish iron ores are more or less attracted by the magnet, while the ores in other countries are less magnetic."

• "At Pittsburgh efforts are being made to establish a minimum wage of \$2.75 for molders in the foundries in that city."

• "The Inland Iron & Forge Co., East Chicago, Ind., whose property shortly passes under the control of the Republic Iron & Steel Co., have lately been making a large output of bar iron. Their production for March was over 5000 tons although their annual capacity is put in the American Iron & Steel Assn's directory at 40,000 tons."

• "We have received official confirmation of the report that the Russian order for 80,000 tons of steel rails was placed with the Maryland Steel Co. last week."

• "The directors of the Pittsburgh Plate Glass Co. of Pittsburgh on Friday, Apr. 7, declared a dividend of 1 pct, the same as that paid in February, when the initial distribution to the stockholders was made."

This sample TEST

lets you determine the DRAWING QUALITY of SHEET METAL

Use it for receiving,
inspection and quality
CONTROL



Depth of draw
indicated by
direct reading

DUCTILITY TESTING MACHINE

Model PA-2

THOUSANDS of dollars of scrap material can often be saved by making this simple cup test. A flick of a switch operates machine. Speed of piston travel is adjustable within a wide range by simple dial setting. Load is applied automatically and uniformly to grip the specimen, followed immediately by penetrator to form cup. Pressure is accurately shown on large gauge with maximum indicating hand; depth of draw shown on depth indicator. Hydraulically operated. Model PA-2 has 15,000 lb. capacity for stock up to $\frac{1}{8}$ " thick; Model PA-3 has 30,000 lb. capacity for stock up to $\frac{1}{4}$ " thick. Write for literature.

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Steel City

TESTING MACHINES, INC.

8839 LIVERNOIS AVE. • DETROIT 4, MICH.

Personals

(Continued from Page 112)

• **Elmer C. Larsen** has been appointed chief engineer for the Tungsten & Chemical Div., Sylvania Electric Products, Inc., at Towanda, Pa. Dr. Larsen had formerly been assistant director of research for the J. T. Baker Chemical Co., and had previously been associated with the Bell Telephone Laboratories. **James J. Sutherland** has been named general manager of the Electronics Div. of Sylvania. Mr. Sutherland joined the Salem, Mass., office of the company as accounting supervisor in 1941 and since 1947 had served as controller of the electronics division in Boston, where he continues his headquarters.

• **Harry C. Dumville** has been appointed director of the New Devices Section of General Motors Corp., Detroit. Mr. Dumville has served as assistant director of the section since 1944. He succeeds **John H. Hunt** who is retiring from General Motors after 36 years' service, the last 17 as head of the New Devices section.

• **D. L. Coleman**, formerly field engineer in the Detroit district for Ampco Metal, Inc., Milwaukee, has been named district manager of the company's newly-established Eastern-Texas division. Mr. Coleman has his headquarters in Houston. **Irving S. Levinson** has joined Ampco as manager of the process industries. Before joining that company, Mr. Levinson had charge of the metallurgical and testing division of the Celanese Corp. in Bishop, Texas.

• **R. J. Roshirt** has been named to succeed **Emerson Frantz** as executive vice-president of Bohn Aluminum & Brass Corp., Detroit. **Victor Mrowca** has been appointed assistant secretary.

• **Donald E. Lewis** has been elected vice-president and general sales manager, Fairmount Tool & Forging, Inc., Cleveland. **Leo V. Anthony**, who has been in charge of sales at Fairmount for several years, has been named to head special equipment sales development work. Mr. Lewis formerly served as sales manager, automotive division, Manzel, Inc., Buffalo.

New Scrap Committee

Pittsburgh

• • • **Henry D. Israel**, Israel Bros. Co., Dayton, has been appointed chairman of the engineering committee of the Institute of Scrap Iron & Steel, Inc., it was announced by **Edward L. Solomon**, Pittsburgh, who is president.

This is a new committee which will endeavor to develop layouts for scrapyards for the most economic handling of material. So far as possible, the committee will attempt to work out streamlined designs and assist dealers in spotting their equipment.

ASM Chapter Award

State College, Pa.

• • • The Penn State chapter of the American Society for Metals, State College, Pa., will make an annual award to a Penn State metallurgist who, in the opinion of the awarding committee, has attained eminence in the metallurgical profession so as to bring credit upon himself and upon his

Alma Mater. The award is to be known as "The David Ford McFarland Award for Achievement in Metallurgy," in honor of Dr. McFarland whose name has been longest and most closely associated with metallurgy at Pennsylvania State College. Dr. McFarland will make the first award on May 12 at a banquet to be given by the chapter.

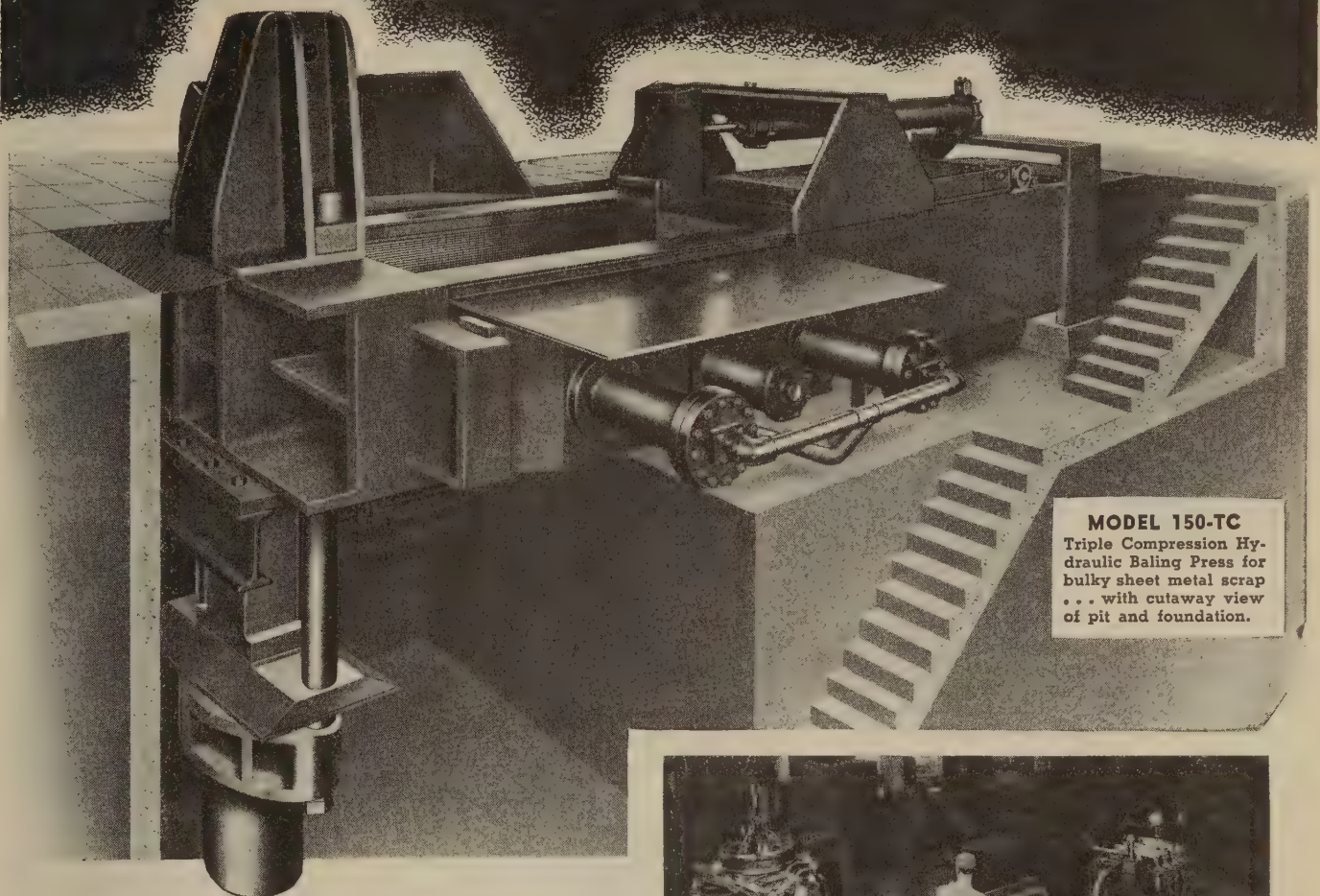
Dravo Corp. Income Up

Pittsburgh

• • • Net income of Dravo Corp. and subsidiaries for 1948 amounted to \$4,195,825, it was reported in the firm's annual report. This compares with the previous year's figure of \$3,639,831.

The net income was equal to \$8.28 per share, against 1947 earnings of \$7.20 per share. Consolidated billings for the year were \$61,120,997 as against \$45,380,128 in 1947. Backlog of business at year end was approximately \$49,000,000. At year's end, the contracting division had a work backlog of \$19 million.

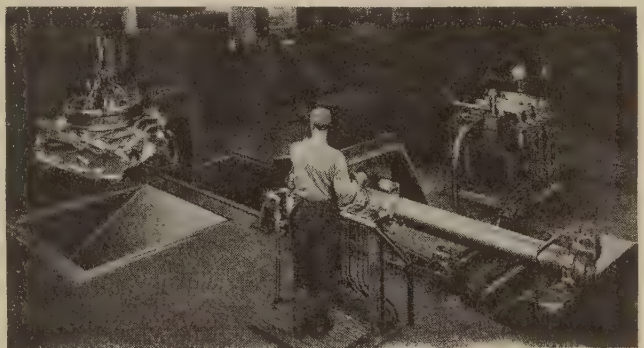
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Triple Compression Hydraulic Baling Press for bulky sheet metal scrap ... with cutaway view of pit and foundation.



Light gauge sheet metal "scrap" ... such as industrial stampings and clip-pings... is an increasingly important factor in the production of new metal, and in the conservation of natural resources. For greatest economy and most effective utilization, it must be compressed into compact BALES of proper size and density. As such, it brings top market prices from mills, smelters, foundries. The Hydraulic, Scrap-Metal Baling Press is necessary, profit-producing equipment in any well ordered plant where this type of scrap metal is gen-



Operating view of a G-H Triple Compression Baler which has served a large Eastern metal working plant profitably for many years.

erated in sufficient volume. Galland-Henning builds powerful, efficient hydraulic balers in a range of sizes and capacities to meet every industrial need. For Experienced Counsel on Profitable Baling of your Sheet Metal Scrap, write —

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MACHINE CAST IRON ROLLS Faster, at Less Cost

with KENNAMETAL ROLL-TURNING TOOLS

It has been customary to rough grind very hard chilled cast iron rolls (75-90 Scleroscope), and to machine softer rolls (60-75 Scleroscope) with high speed steel tools.

The new, and more economical, method for both types is turning with Kennametal tools designed especially for plunge cutting on the usual hand-feed roll lathe.

They cut the machining time in half, as many roll shops have demonstrated to their profit.

These tools are rugged. The "business end" is Kennametal—a very hard cemented carbide, unusually strong and tough. It stands the gaff of crashing with a hefty cut through scale, chill balls, and burned spots (that wear grinding wheels fast and turn the edges of high speed steel tools)—and does this in a hurry!

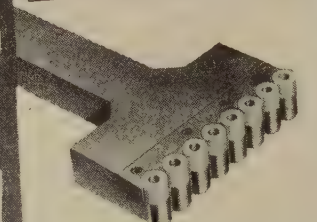
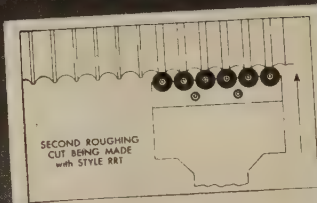
Two general types of these tools are available:

Style RRT, recommended for roughing, has a series of indexable Kennametal cylinders, or "buttons", firmly secured to the steel shank. When cylinders become dull they are turned to present new, sharp edges.

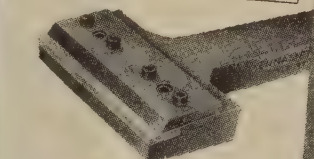
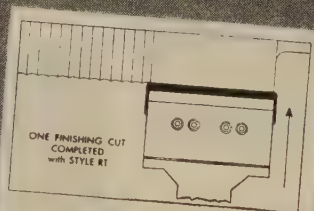
Style RT, recommended for finishing, has a flat, advanceable Kennametal blade, secured in position by a clamp and serrated back-up plate. Four cutting edges are usable in succession before any grinding is necessary.

Maintenance of these roll turning tools is very simple. To sharpen, cylinders of the roughing tool are faced on the tops only, and blades of the finishing tool on the long edges only. The marked savings in this technique can be readily visualized.

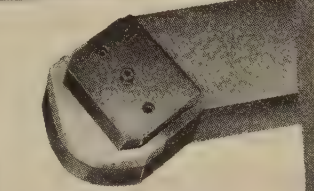
Here then are tools that help to offset the rising costs for time and labor in the manufacture and servicing of mill rolls. Our nearest representative will assist you in applying them to your problems.



ROUGHING STYLE RRT
Made in four standard widths—
4", 6", 8", and 10".



FINISHING STYLE RT
Made in four standard widths—
4", 6", 8", and 10".



FILLETING STYLE FT
Clamped-in, advanceable Kennametal blade. Made in six standard sizes — radii for the most common fillets.



KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

Predicts New England Construction Volume To Remain at Record Levels

Boston

• • • Public construction in 1949 is expected to offset a probable decline in new private residential building and may boost total construction volume in New England so that it will equal or exceed the 1948 level, the Federal Reserve Bank of Boston recently reported in its Monthly Review.

At the same time, the bank stated that New England mortgage lenders last year made the largest volume of loans of any year in their history. It added, however, that new construction put in place during 1948 was valued at current prices and that in physical terms the construction activity of 1948 was equaled in 1940, 1941 and 1942 and in several years during the 20's.

Even if industrial production should decline moderately in 1949, industrial construction should remain high, the bank said. Much of the planned activity is part of fixed long-range programs. Representative New England lending agencies expect no important change in industrial and commercial building in 1949 from the 1948 level. The anticipated decline in private residential building may nevertheless push total private construction in 1949 slightly below the 1948 total.

Completes New Laboratory

Detroit

• • • A new antibiotics laboratory has been completed here for Parke, Davis & Co. by The H. K. Ferguson Co., industrial engineers and builders, according to a recent announcement.

Containing the most modern facilities, the plant will provide laboratory, development, production and administrative facilities. Of structural steel construction with brick and stone trim exteriors, the building is 275 ft long and 75 ft wide, and has a full basement in addition to its 4 floors.

Laboratory and processing areas are completely air conditioned, and the remainder of the structure is ventilated with air drawn through electrostatic filters.

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—when you need High Strength Steels

REMEMBER, when you use U.S.S. COR-TEN or U.S.S. MAN-TEN, instead of carbon steel, your steel supply will go one-third farther. Our warehouses from coast-to-coast will do their best to supply your needs in any of these four High Strength Steels—"The steels that do more." Phone, wire or write the warehouse or sales office nearest you.

U.S.S. COR-TEN—A steel that has a yield point $1\frac{1}{2}$ times that of structural carbon steel . . . that has greater impact strength and abrasion resistance . . . and whose resistance to atmospheric corrosion is 4 to 6 times higher.

U.S.S. MAN-TEN—A steel that has twice the atmospheric corrosion resistance of plain carbon steel. Tough . . . high strength . . . hard-wearing and highly resistant to shock and vibration.

U.S.S. ABRASION-RESISTING—Fills need for a low-cost, abrasion-resistant steel. Costs little more than plain carbon steel. In certain applications wears as well—sometimes better—than higher priced alloys.

U.S.S. MANGANESE-NICKEL-COPPER—Affords weight reduction through high strength, greater toughness and improved characteristics in applications involving cold forming, metal arc welding and moderately severe impacts in low temperature service.

Fill in and mail the coupon NOW for free booklets on U.S.S. High Strength Steels.

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Without obligation on our part, please send us free booklets on U.S.S. High Strength Steels.

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

Submits \$1.4 Billion Smelting Plan For Proposed Labrador Iron Ore Output

Quebec

••• In a report dealing with the Labrador iron ore deposits prepared by Prof. Gerard Letendre, director of the department of mining and metallurgy at Laval University, submitted to the Quebec government and released by Premier Duplessis, it is pointed out that the cost of smelting and steel plant installation to handle Ungava's proposed iron ore output of 10 million tons a year would be more than \$1.4 billion. Electric smelting would add \$300 million to the cost of the plant. Prof. Letendre's report was prepared after a tour of European steel manufacturing centers.

The Quebec government has ruled that for the present it is more practical for private enterprise, partly backed by United States capital, to bear the cost of opening Ungava mines and export the ore across the border for manufacture.

Prof. Letendre's report says smelting of 10 million tons of iron ore annually would take 172 electric furnaces, with a daily pig iron output of 100 tons each. The cost of such furnaces is about \$2 million each.

Production of 6 million tons of pig iron from the 10 million tons of ore would take a 2 million hp installation and the cost would be \$350 million.

If a complete steel works, including rolling mills, furnaces and other equipment were added to the pig iron plant to give a completely integrated iron and steel plant, the total cost would be, roughly, \$1.4 billion, the report said.

Critics of the policy say Canadian capital should be employed and that the aim should be the establishment of a Quebec steel industry to give the province's population the benefit of all stages of steel manufacture and its sale.

Prof. Letendre expressed the opinion that over the years "a few small profitable electric smelters could perhaps be built here and there" in Quebec, depending on

what districts have power surpluses.

"From a technical standpoint," said the report, "there would be no overwhelming difficulty in producing by one method or another 5 million tons of steel, or more, in the province as soon as mining operations start in New Quebec."

"However, the products of the steel works would have to be sold, and nobody has as yet explained how and where such a quantity of steel could be disposed of in the next few years."

"It would be desirable to have an important iron and steel industry in the province, but it is essential that a much more detailed investigation be carried out if an appropriate conclusion is to be reached."

Diversification Helps To Maintain Sales Volume

Chicago

••• C. S. Davis, president, Borg-Warner Corp., recently told stockholders here that the company is firmly entrenched in a wide variety of industries, and backed by his postwar expansion program, is prepared to successfully meet the return of normal business conditions. Borg-Warner in 1949 will spend about \$5 million to complete its \$40 million expansion and improvement program.

Mr. Davis stated in his annual report that sales for the first quarter of 1949 are approximately equal to last year's, but earnings are lower because the prices were held stable as costs continued to rise. Net profits last year, after allowing a \$3.5 million reserve for price decline, were \$26,214,993, or \$10.93 a share. This compares with \$20,023,148 after a similar provision of \$4.5 million or \$8.28 a share in 1947. Dividends totaled \$4.50 a share for the year, or about half of the net income. Last July 3, stockholders were paid a quarterly dividend of \$1.00 and a special dividend of \$1.50. The quarterly payment of \$1.00 was declared payable Apr. 1.

Alcoa Has Optimistic Outlook on Long-Range Demand for Aluminum

Pittsburgh

• • • The long-range outlook for aluminum is decidedly optimistic because today's demand for the metal is apparently based on its own merits rather than on shortages of other metals and materials, according to Aluminum Co. of America's 1948 Annual Report.

Net income for 1948 was \$39,-941,367, compared with \$30,025,-588, the adjusted figure for 1947. After deduction of preferred stock dividends, the net income per share of common stock in 1948 amounted to \$7.66. The adjusted 1947 income per common share was \$5.63.

At present, the shortage of available electricity, which restricted 1948 output, shows signs of easing, the report stated.

Alcoa began construction of a new aluminum-producing plant on the Gulf Coast at Point Comfort, Tex., in 1948. It will use natural gas from offshore wells to generate electricity, and is scheduled to begin production early in 1950.

In addition to the Point Comfort plant, Alcoa's new sheet and plate mill at Davenport, Iowa, neared completion, although major operations there will await greater availability of metal. Completed during the year was a new Alcoa Diecasting Works at Chicago and these facilities are now in partial production.

The company's obsolete smelting works at Niagara Falls, N. Y.,

was permanently closed at the end of February, 1949, and equipment there is being dismantled.

Distribution of Alcoa aluminum products to industries during 1948 paralleled recent trends, the report stated. Alcoa's shipments of aluminum and its products during the year were approximately as follows: building products, 18 pct; transportation, 13 pct; cooking utensils, 9 pct; machinery, electrical and general, 4 pct; household appliances, 9 pct; power transmission, 6 pct; shipment to fabricators for further processing, 25 pct; all other uses, 16 pct.

Savings Expected For Automobile Purchasers

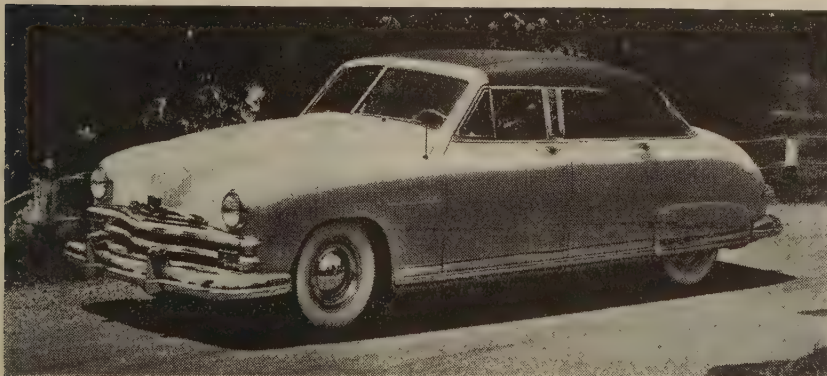
Detroit

• • • Will the end of conversion steel mean a drop in auto car prices?

Informed Detroit sources believe that a minimum saving of \$30 in the production cost of a car could be realized if conversion steel costs can be eliminated entirely. Some sources have estimated the savings as high as \$50.

With automobile production continuing at peak rates and the steel demand by other industries holding reasonably steady, conversion will not disappear overnight. However, it is expected that substantial savings in steel costs will be realized by the car makers during the next few months. This has caused some Detroiters to speculate as to whether or not the price tags on automobiles will be reduced as steel costs come down.

TOP STAYS UP: Latest addition to the line of cars styled along the lines of convertible models with a safety all-steel top is the recently announced Kaiser Virginian. The fabric used for the top covering is a special grade of satiny vinyl-nylon. In the K-F model the concealed roof panel is stamped with ridges simulating the usual roof bows of a convertible.



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Reports Decrease in Outlays for Business Expansion This Year

Washington

• • • American business, exclusive of agriculture, is expected to spend a minimum of \$18.3 billion on new plants and equipment in 1949, according to the first such government forecast, a joint statement by the Securities & Exchange Commission and the Dept. of Commerce.

While this figure will be approximately a billion less than last year—when the figure was \$19.2 billion—the estimated physical volume is expected to be about the same as for 1947.

Almost half or \$8 billion of the total will be spent by manufacturers with the largest outlays being invested during the last half 1949, a slight decrease below 1948.

Expansion of public utilities is anticipated to increase a half-billion over last year for a 1949 total of more than \$3.1 billion. On the other hand, commercial expansion (stores, shops, offices, etc.) is expected to decline by \$250 million to a total of \$5 billion. This figure also includes the service trades.

Approximately 70 pct of total outlays will go into purchase of machinery and equipment; the remainder will be used for construction.

Submits Low Hospital Bid

Buffalo

• • • The John W. Cowper Co. Inc. here submitted the low bid of \$3,738,000 for construction of a 620-bed medical and surgical building at Buffalo State Hospital. The company also made a low bid of \$584,700 for a power house at the hospital.

Low bid of \$298,887 for heating facilities in the surgical and medical building was submitted by the Quackenbush Co. of Buffalo and George H. Drake, Inc. of Buffalo was low with a \$368,331 bid for sanitary work. Quackenbush also was low with a bid of \$743,832 for heating work in the power house.



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Assembly time is shortened, costs reduced and structures made more secure when the cap screws used in your products are accurately formed and threaded, and are uniform in all respects.

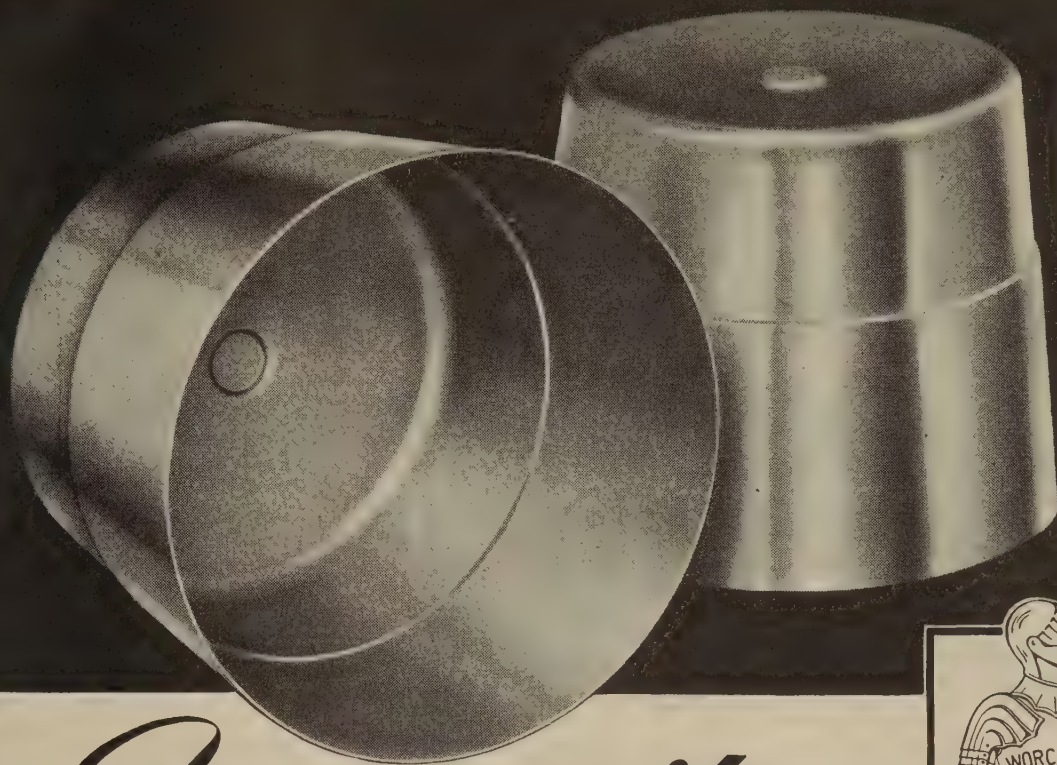
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Ingenuity...

This appears to be a simple stamping. However, the combination of the tapered shape and the light gauge material makes it difficult to draw without wrinkles. Once introduced, it is almost impossible to eliminate a wrinkle.

Carefully planned tooling — the correct number of preliminary operations, plus an ingenious reverse draw — solved this difficult stamping problem.

Result...uniform parts with a minimum of die marks, permitting economical preparation of the surface for high lustre plating and polishing.

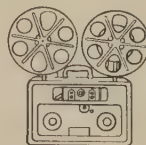
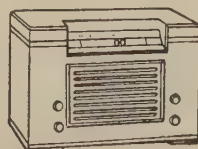


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Competition Reduces Appropriations For Construction Work

Washington

••• Noting that "competition is returning in the construction industry," the House of Representatives last week slashed an average of 15 pct from the Army Corps of Engineers' estimate of construction projects to be undertaken in the next fiscal year.

The total amount approved by the House is \$593,292,270. This figure is more than \$1 billion less than the appropriation for fiscal 1949, and is about \$173 million less than the sum recommended by the Bureau of the Budget.

Rep. Kerr, D., N. C., told the House that on one project this year the lowest bid received was approximately 10 pct below the Army Engineers' estimate of the cost of the proposed construction project.

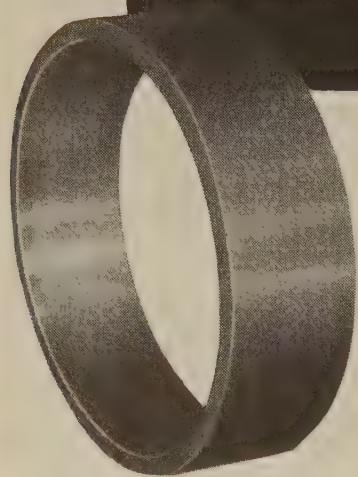
"The committee, in view of present trends in costs, does not feel it should appropriate at a higher level," Kerr declared. He pointed out that the committee had not reduced the amount requested for any particular program and had approved substantially the entire program requested by the Corps of Engineers.

Kerr said "it seems most likely" that a downward trend in construction costs will continue and become more pronounced during the fiscal year 1950. "The availability of building materials generally has increased relative to the aggregate of demand for such materials," he said. "Whereas 6 to 8 months ago invitations for construction jobs attracted only 2 or 3 bids, the number of bidders per job at present has increased markedly throughout the country, indicating that competition is returning in the construction industry."

ACF Declares Dividend

New York

••• The Directors of American Car & Foundry Co. recently declared a dividend of 1 $\frac{3}{4}$ pct per share on the preferred stock of the Company outstanding, payable Apr. 5, 1949, to stockholders of record Mar. 29, 1949.



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many alloys
which were
too costly or
impracticable
to forge or cast
by old-fashioned
methods

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The Lebanon CENTRI-DIE process of making centrifugal castings opens the door to the use of many alloys which were impractical or too costly to fabricate by any other method.

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NOW ALL SHAPES AVAILABLE!

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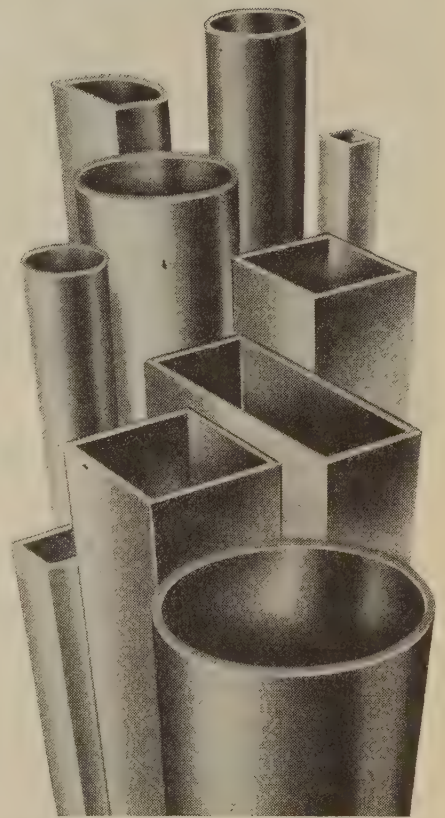
USE the structural advantages of J&L *Electricweld* Tubing to strengthen and lighten the weight of your products.

USE the quality-controlled surface of J&L *Electricweld* Tubing to obtain *better, smoother* finishes.

USE J&L's experience in tubing design and manufacture to help you select the best sections and to determine the most practical tolerances that will give you the lowest possible cost.

There's nothing more versatile than a tube. There's no tubing better than J&L *Electricweld* Tubing.

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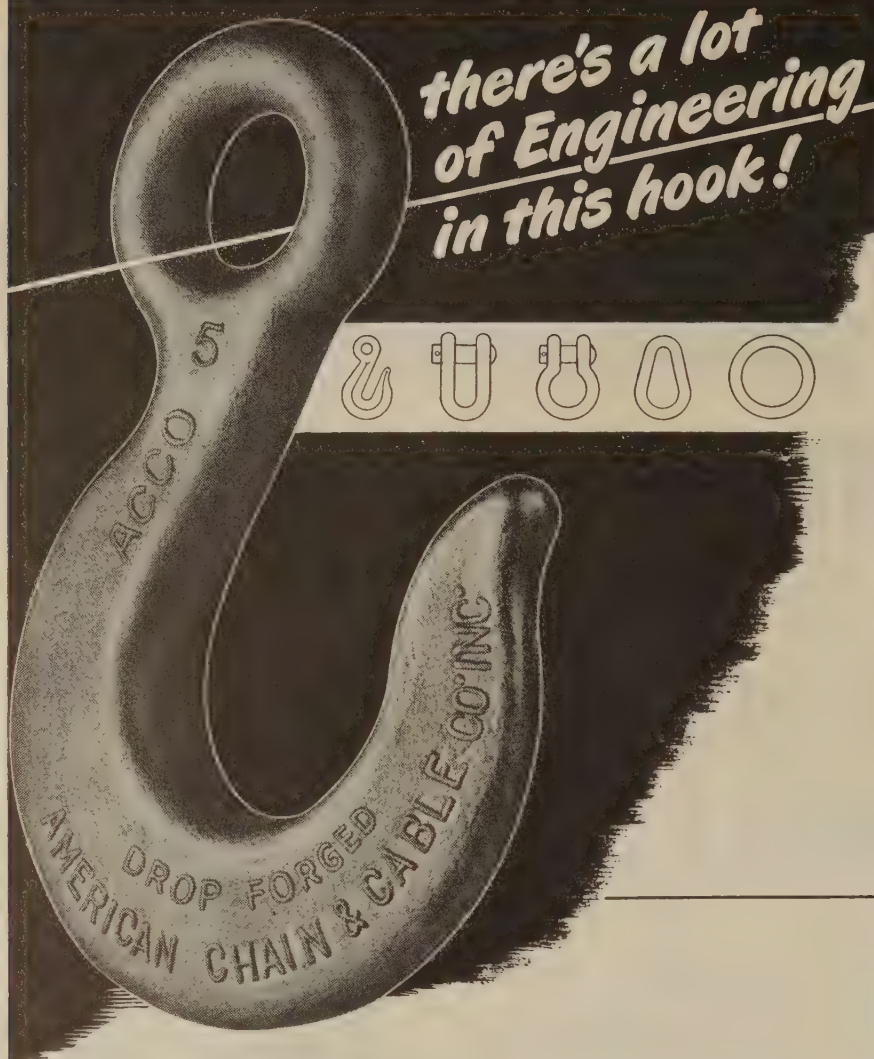
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Export-Import Bank Extends Credits For Industrial Expansion

Washington

• • • A major portion of the \$61 million in new credits extended by the Export-Import Bank during the final half 1948 was issued for the purpose of expanding industrial facilities of the Americas.

Most of the loans, the bank states, will be spent with United States industry for equipment, materials and services. The borrowing countries will develop and expand their own industries with a view to reducing imports and increasing exports.

Largest beneficiary was the Chilean steel industry, the Corporacion de Fomento (Republic of Chile) obtaining an additional \$20 million to continue construction of its \$83 million integrated steel plant.

Back in 1945, the bank issued an initial loan of \$28 million to start the work. Last year's loan was approved when the Chilean group had completed arrangement for its own portion of the financing.

The new Chilean steel works is expected to begin operation some time in 1950. When in full production, it is estimated that steel imports will be decreased by from \$13 to \$15 million.

A credit of \$1.2 million was also authorized in favor of a Chilean textile factory for purchase of equipment. Likewise, a loan of \$375,000 was granted the Chilean Manufactuera de Metales to buy North American metalworking equipment for manufacture of tools and parts.

In Canada, a credit of \$5 million was authorized for continuation of the development of the Steep Rock Iron Mines. In view of their importance to United States steel mills, the RFC had made previous loans as far back as 1942 for this purpose. Under conditions of the bank loan, Steep Rock would provide a matching \$5 million from private sources and agree to ship upwards of 3 million tons of iron ore annually to the United States.

Other loans included \$1.5 million to a Mexican steel mill (La

Consolidado, S. A.) to supplement financing which had already been effected by United States owners and operators.

Another \$8.3 million went to 12 Brazilian companies for purchase of United States equipment for expanding power facilities. Similarly, \$2 million was granted La Electricidad de Caracas, Venezuela.

Grants Extension For Delivery of ECA Goods

Washington

• • • A three-month extension for delivery of Marshall Plan goods authorized against the final 1949 quarter has been granted by the Economic Cooperation Administration. Fourth quarter authorizations may still be delivered up until June 30, provided contracts were corrected by Apr. 1.

Requirement that suppliers must promise delivery of ECA goods within the quarter specified in the authorization has been set aside by ECA. However, ECA says that first quarter 1949 contracts, completed before Apr. 1, must be delivered also before June 30.

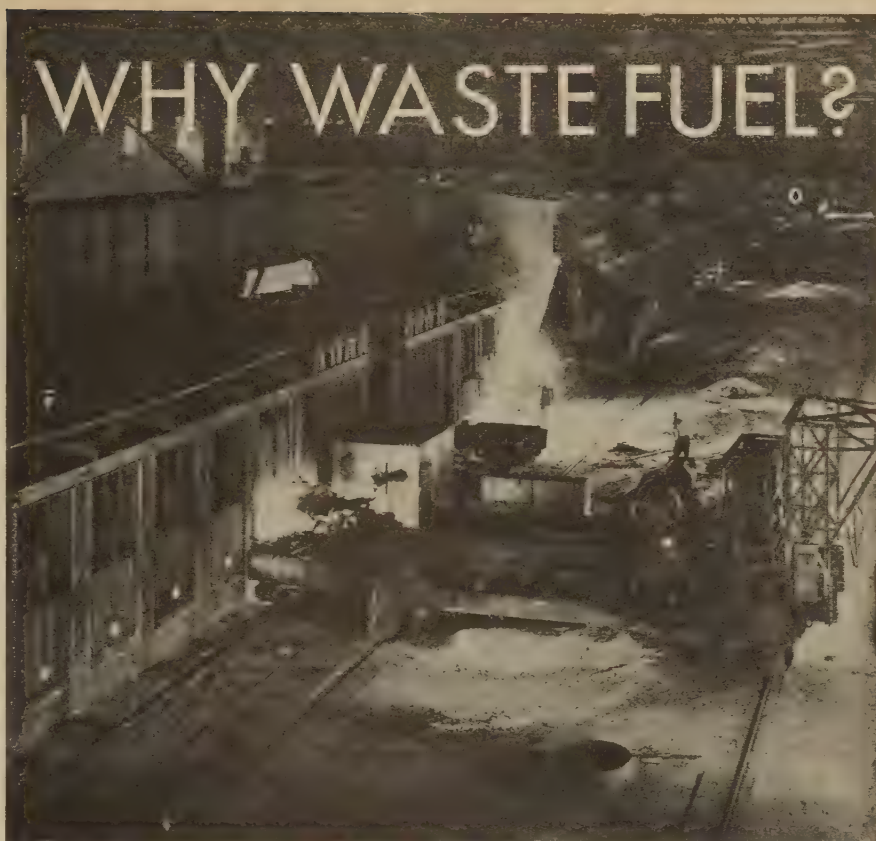
In an effort to clean up undelivered purchases ordered against second and third quarter 1948 authorizations, ECA has agreed to extend delivery time also to June 30 if participating nations will supply lists of such contracts outstanding as of Mar. 31, present expiration dates.

Increases Heating Value

Buffalo

• • • The Iroquois Gas Corp. has announced an increase, effective immediately, in the heating value of the mixed gas it supplies here from an average of 850 Btu to 900 Btu.

The company said the increase was made possible by the greater supply of natural gas now available. Iroquois has asked the State Public Service Commission for permission to increase its gas rates 22 pct over the levels prevailing prior to Dec. 18, 1948.



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MORE THAN 25% of Open Hearth fuel can be wasted through heat lost through brickwork and heat absorbed by cold infiltrated air.

Therm-O-flake INSULATIONS are designed to reduce heat losses and seal furnace walls against cold air infiltration. These are used regularly on hundreds of open hearth furnaces and save steel producers thousands of fuel dollars daily.

Therm-O-flake ENGINEERS will prepare an accurate fuel economy survey of existing furnaces in your plant and submit complete thermal data and recommendations for safe maximum insulation of any open hearth furnace, on request.

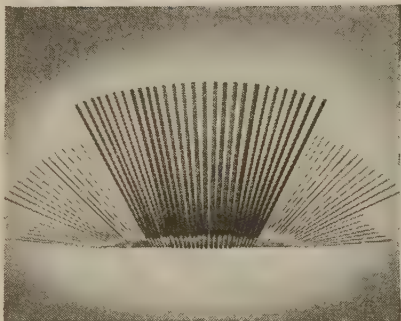


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Literature is brief but comprehensive, covering specifications, properties and applications for each electrode. Copies available on request received on company letterhead. Address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

NEW ARC WELDERS BOOST AC and DC PERFORMANCE



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Built-in capacitors for high power factor, wide current range for full rated output—and fingertip, stepless current control for precise current setting are featured in the AC units. Available in 150 to 500 amp models for manual arc welding, additional models for inert arc and automatic welding.

Full capacity, rugged duty DC arc welders are compact, light in weight—half the size and half the weight of older types—and are equipped with simplified current control, automatic electrode selector. Furnished in 150 to 400 amp sets—motor driven, engine driven or belt-drive.

Descriptive folder gives full particulars. Address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

Republic Executives Anticipate Continued Demand for Steel

Cleveland

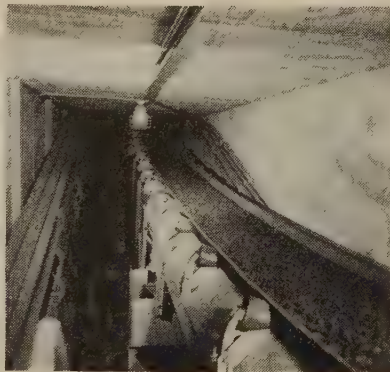
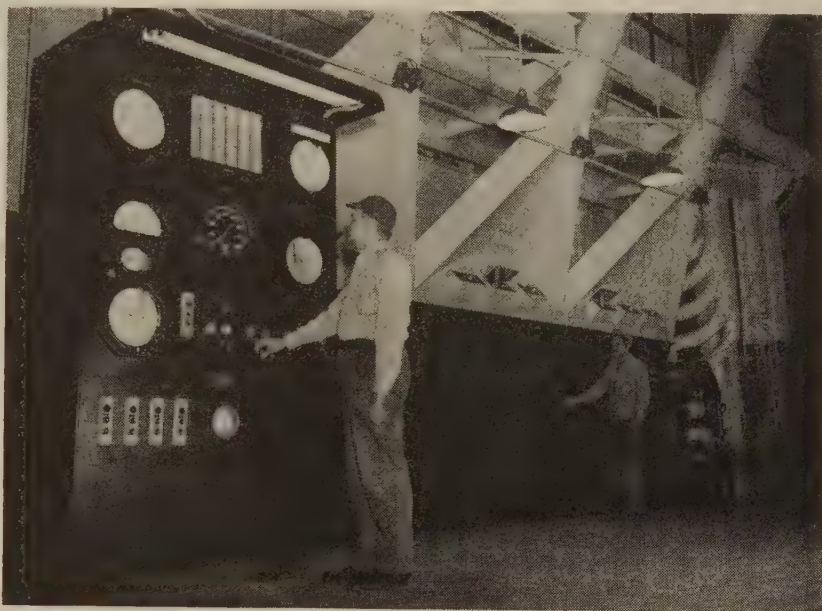
• • • Continued strong demand for steel for the first half of 1949 is anticipated by T. M. Girdler, chairman of the board, and C. M. White, president, Republic Steel Corp., in their letter to company stockholders in the Annual Report.

The letter pointed out that "barring serious interruptions to production, there is a probable balance between the supply of and the demand for steel during the last months of 1949."

"In spite of sharp increases, not only in the cost of capital improvements but in wages and the cost of materials and supplies, the price of steel has remained at a low level compared with other commodities," the Republic executives reported.

"This is shown by the composite steel price index, which stood at \$46.20 per ton on Jan. 1, 1939, and \$75.20 per ton on Jan. 1, 1949, a 63 pct increase. This can be contrasted with a general increase in the wholesale price level during the same period of 110 pct."

The need for governmental action to permit a more rapid depreciation of new high cost facilities for income tax purposes during years of high production and earnings was pointed out. The letter stated that a policy of accelerated depreciation had been adopted for the year 1948 and retroactive to Jan. 1, 1947. This depreciation is taken on the actual cost of facilities represented by postwar capital expenditures and is applicable to the years of high production and demand in which the economic value is the greatest. Accelerated depreciation amounting to \$7 million was charged for the year 1948.



CAPITAL'S HEATING PLANT: Operations at the capital's new west central heating plant are unique. The conveyor belt, shown left, carries 150 tons of coal per hr a distance of 650 ft to the plant's storage yard. The panel, above, controls the entire operation which supplies public buildings in Washington with steam heat.

Backlog Helps to Set Record Peacetime High

Milwaukee

• • • Walter Geist, president, Allis-Chalmers Mfg. Co., in the annual statement to stockholders said, "Our first full year of uninterrupted production since World War II reached a peacetime high of \$328,101,328." The profit for the year ending Dec. 31 was \$15,441,523 as compared with a profit of \$5,422,308 in 1947. The profit for 1948 is equal to \$5.67 a common share after preferred dividends of \$1,168,001. This compared to \$1.69 a common share in 1947.

The backlog of orders held by Allis-Chalmers on Jan. 1 amounted to \$169,553,221. Concerning last year's operation Mr. Geist said, "The record level was due to the result of a large backlog of orders, continued strong demand for a major portion of the company's products, and the effect of inflation in higher costs and selling prices."

Holding Machineability Symposium at Purdue

Lafayette, Ind.

• • • A symposium on machineability will be held at Purdue University, West Lafayette, Ind., on Saturday, Apr. 23, under the sponsorship of the Purdue chapter of American Society for Metals. The purpose of this symposium is to bring together persons interested in the machining operations of manufacturing in order to discuss their mutual problems and become familiar with recent developments in the field of machining.

Registration for the symposium will open at 9 a. m. Saturday morning, Apr. 23, in Memorial Union Bldg. at Purdue. Registration will be followed by an inspection trip through the recently remodeled and re-equipped machine shop laboratories of the Purdue department of general engineering.

Dr. Arthur F. Focke of the Diamond Chain Co., Indianapolis, will serve as chairman for the technical sessions of the symposium. Dr. M. Eugene Merchant, of the Cincinnati Milling Machine Co., will

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Niagara Aero After Cooler assures all these benefits because it cools compressed air or gas below the temperature of the surrounding atmosphere; there can be no further condensation in your air lines. It condenses the moisture by passing the air thru a coil on the surface of which water is evaporated, transferring the heat to the atmosphere. It is installed outdoors, protected from freezing in winter by the Niagara Balanced Wet Bulb Control.

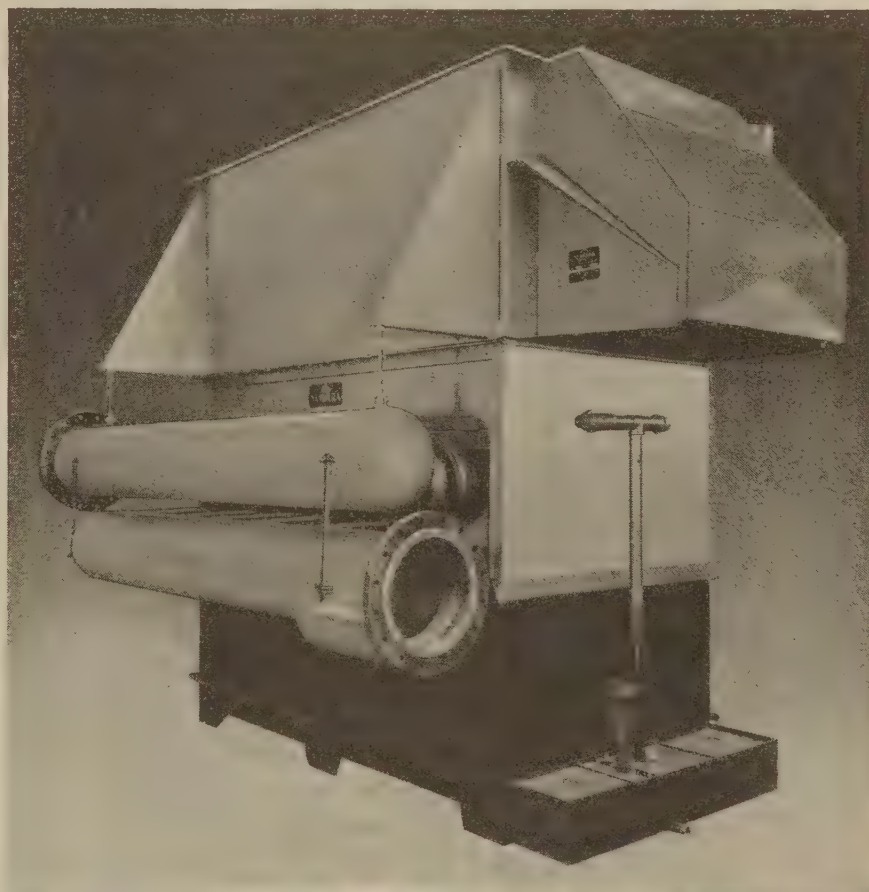
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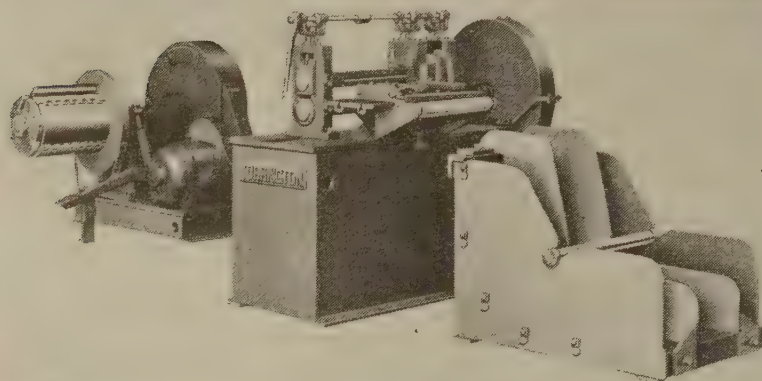


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**ACCURATE SLITTING
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AT MAXIMUM SPEED!**



On the job in Bridgeport, Conn.



TORRINGTON'S HIGH-SPEED SLITTING LINE **Converts wide stock to any desired dimension!**

- ★ Motor-driven slitter for threading up!
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These compact, easily operated Torrington machines have been designed to meet the needs of users who require slitters which can be quickly set up and operated with minimum time and effort.

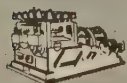
Here are just a few of your advantages with a Torrington Slitter on the job: 1. Ability to secure metals in wide widths *quickly!* 2. Elimination of large and unbalanced inventories of cut-to-width materials! 3. Quicker deliveries on shorter notice because of broader source of supply! 4. Instant availability of slitter to convert wide stock to any dimension for daily production needs!

The heavy construction of Torrington Slitters assures years of continuous, dependable service. With the proper tool set-up, it is possible to hold widths within the limit of .001", plus or minus.

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speak on "The Fundamentals of Machineability" and C. E. Sims of the Battelle Memorial Institute will discuss "Recent Developments in Machineability." A. W. Lindert of the Standard Oil Research Laboratories will discuss "Recent Developments in Cutting Oils."

At 6 p. m. a dinner meeting will be held in Memorial Union Bldg. at which a resume of the symposium will be given. Visitors are assured that this meeting will be ended by 8 p. m., which will give them time to return to their homes that night.

A. W. Hoppe of the Purdue chemical and metallurgical staff and C. H. Dameron of the Lafayette plant of the Aluminum Co. of America are in charge of arrangements for the symposium. A registration fee of \$2.50, which will include the dinner, will be charged, and for those who do not remain for the dinner, the registration fee will be \$1.00.

Building Costs Unchanged

Cleveland

• • • Recent increases in the efficiency of construction labor have just about offset the first-quarter advance in labor and freight rates, according to The Austin Co., which reported its current industrial building cost index at 174, unchanged since October 1948.

"While the quoted prices of most construction materials, other than lumber, have stabilized around levels established at, or prior to, the year end, recent interim freight rate increases and isolated wage advances have eaten up most of the savings we have been able to make by improvements in labor efficiency and in the tighter scheduling of construction work," according to George A. Bryant, Austin president.

Reports Net Income Off

New York

• • • Revere Copper and Brass Inc. reports net income for 1948 of \$6,925,027, after charges including depreciation and Federal income taxes, equal after preferred dividends to \$5.02 per share on the common stock. This compares with \$8,112,536 or \$5.93 per share for 1947.

Lays Keel for 2 Ultra Modern Express Liners

Quincy, Mass.

• • • The keel for the first of two ultra modern express liners, first such ships ordered by a private operator in this country in more than a decade, were laid recently at Bethlehem Steel Co.'s Fore River plant.

The twin vessels ordered by the American Export Lines and scheduled for Mediterranean service will be two of the largest and fastest in the American Merchant Marine. The keel of the second ship is expected to be laid, also at the Quincy yard, in June. Both are scheduled to be delivered before the end of 1950.

When equipped completely, the vessels will represent an investment of \$50 million, believed to be the largest commercial passenger ship order ever placed in this country. Each ship could carry 5000 troops, according to John E. Slater, executive vice-president of American Export Lines.

Ordnance Association Holds Annual Meeting

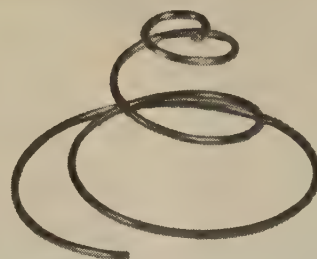
Los Angeles

• • • Current progress in the fields of rockets, guided missiles and other newer forms of defense equipment will be stressed at the 31st Annual Meeting of American Ordnance Assn. to be held here at the Hotel Ambassador, Apr. 26, 1949. Some of the nation's leading authorities in these fields will address the gathering of scientists, engineers and industrialists who will attend from all sections of the United States.

Brig. Gen. Philip G. Blackmore, Commanding Gen., White Sands Proving Ground, N. M., will lead the panel of speakers on rocket and guided missile development. Others on the program for the technical and scientific session on the morning of Apr. 26 are Rear Admiral W. G. Switzer, Commander, U. S. Naval Ordnance Test Station, Inyokern, China Lake, Calif., and Brig. Gen. William L. Richardson, Chief, Guided Missiles Group in the Office of the U. S. Air Force in Washington.

James L. Walsh, New York, president of the association, will

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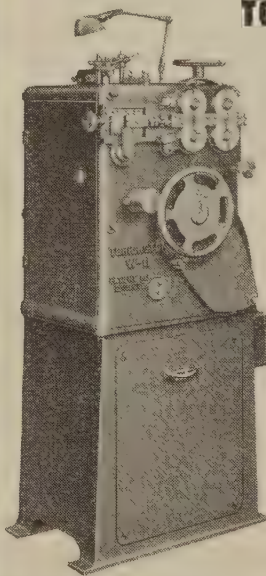


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preside at this technical and scientific session; Harvey C. Knowles, Cincinnati, vice-president of the association, will serve as chairman. Mr. Knowles is vice-president of Procter & Gamble Co.

The 31st Annual Dinner Meeting of the association will take place in the Embassy Room of the Hotel Ambassador at 7 p. m., Apr. 26, 1949. Some of the leading National Defense authorities will come from Washington to speak at this meeting.

Reed-Prentice Reports Decrease in Net Income

Worcester

• • • The Reed-Prentice Corp.'s 1948 report is unique from a machine tool builder's viewpoint as it contains much detailed information regarding its business.

The company was one of the first machine tool builders in Massachusetts to manufacture plastic making equipment. Regarding this sideline, Frederick W. McIntyre, Sr., president, states in the report that net shipments of plastic injection molding machines and parts represented about 56 pct of the total net shipments for 1948, and showed a healthy improvement over the shipments in 1947. Demand for these machines continues and the company has a substantial backlog of orders.

Net shipments of machine tools and parts were somewhat ahead of those of 1947, while net shipments of diecasting machines and parts was substantially less. Demand for these two last mentioned products continues curtailed, Mr. McIntyre says.

Net sales of Timberhog gasoline saws and parts amounted to about 22 pct of 1948 net shipments of all products and to about 50 pct of net shipments of saws in 1947. However, the company has on hand contracts and orders for saws aggregating \$676,000 for 1949 delivery and \$457,000 for delivery this year and 1950.

The company wound up 1948 with current assets of \$3,135,193 and current liabilities of \$1,249,795, leaving a working capital of \$1,885,398. The net profit for 1948 was \$326,235, equal to 91¢ a share; in 1947 it was \$680,170, or \$1.90 a share. Sales were \$4,908,374; in 1947 they were \$5,926,395.

Explains Carbide Cutting Tools in New Booklet

Detroit

••• In an effort to answer many questions on the use of single point carbide cutting tools, including questions on design, manufacture, use, maintenance, inspection, and application, Carboloy, Inc., has published a "Carboloy Cemented Carbide Tool Manual." Divided into 10 major classifications, the individual topics are thoroughly explored and well illustrated. The contents are so arranged that the material of primary interest appears in one column in bold face type while material of secondary or explanatory nature is printed in smaller type in another column.

Typical of the data contained in the booklet are the explanations on where to use various grades of Carboloy carbides in cutting applications, and the recommended feeds, speeds and grades for cutting specific SAE steel grades, cast steel, stainless grades, cast and malleable iron, semi-steel, brass and bronze, aluminum, zinc, rubber, copper, fibre, plastics and Monel. Also, information is contained concerning the selection of rake and relief angles on carbide tools. Types and methods of using chipbreakers are described, along with specific data on exact specifications for chipbreakers for different types of work.

Augmenting this material are nomenclature diagrams, nomographs for the determination of tip thickness, shank size and nose radius of the various types of single point tools.

Holds Spring Conference

New York

••• Ernest M. Knapp, assistant treasurer of Ferro Machine & Foundry, Inc., and Royal G. Parks, controller of the National Malleable & Steel Castings Co., both of Cleveland, have been appointed to the registration committee for the Midwestern Spring Conference of the Controllers Institute of America. The conference will be held in that city, May 1-3, in the Hotel Cleveland.

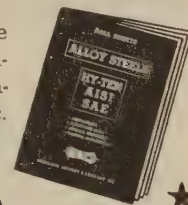
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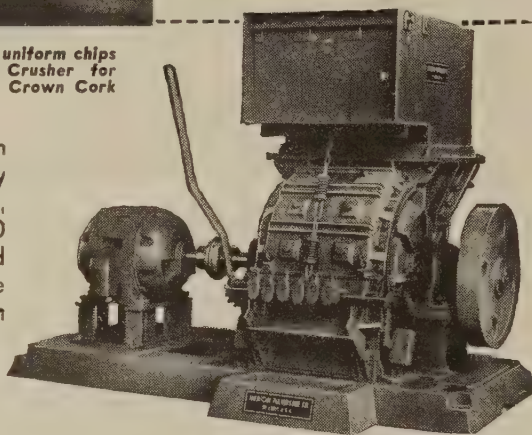
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Washington Award to Be Presented to J. L. Savage

Chicago

• • • On Apr. 20, John Lucian Savage, internationally famous civil engineer, will be presented the Washington award, awarded annually by the joint committee of the American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Society of Mining and Metallurgical Engineers, and the Western Society of Engineers. Mr. Savage, 1949 winner of the award, will discuss the Yangtze River dam project in China at the dinner meeting Apr. 20.

Mr. Savage has been directly responsible for most of the large dam construction in recent years. Some of the prominent projects on which he worked are the Hoover Dam and Power Plant, Shasta Dam, All-American canal system in California, Continental Divide tunnel in Colorado, Norris and Wheeler dams in Tennessee, and the Underground Fuel Storage project at Pearl Harbor.

Receives Safety Award For Outstanding Record

Youngstown

• • • A bronze plaque recognizing completion of 1 million man-hr without a disabling injury has been presented to the Campbell blast furnace department of Youngstown Sheet & Tube Co. by H. E. Englebaugh, manager of the company's Youngstown district properties.

This is the third million man-hr plaque presented to the Campbell blast furnace department, the only department in the company's Youngstown district to achieve this record. Campbell won its first plaque in 1935 and a second plaque 10 yr later.

Mr. Englebaugh said the three records have been chalked up in face of the fact that blast furnace work is considered as hazardous as any steel plant operation. He attributed the records to cooperation of employees and supervision on all general company safety problems and in closely following safe practices for blast furnaces.

The National Safety Council in Chicago was unable to positively state that these three records are

an outstanding national record, but said, "this is the best we have in our files. It is an outstanding achievement from several standpoints. The work is hazardous, the department is a large one and each record required more than a year."

Included in blast furnace operation is the sintering plant which went into operation in October, 1942. At the start of sintering operations, Raymond McGee, general foreman, was the only man with any sintering plant experience. Every member of his crew, including his turn foremen, had to be trained in making sinter. This new operation provided increased hazards for the blast furnace department.

Elects New Officials

Boston

• • • Edward Page of West Newton, Mass., associated with the company for more than 40 years and president since 1927, has been elected chairman of the board, New England Coal and Coke Co. H. B. Baird of West Chester, Pa., vice-president of Eastern Gas and Fuel Associates in charge of coal sales, succeeds Mr. Page as president of New England Coal and Coke Co., while Walter Rothenhoefer of Pittsburgh, general manager of sales of Eastern Coal and Fuel Associates' coal division, has been made vice-president of the New England Co. Paul B. Rice of Wellesley Hills, Mass., vice-president and general sales manager of New England Coal and Coke Co. since 1938, has been made executive vice-president.

Continues Building Project

Buffalo

• • • Despite a sharp falling off in demand for dyestuffs and other products from last year, the National Aniline Div. of the Allied Chemical & Dye Corp. is going ahead with a \$3.5 million dyestuffs-plant construction project here.

One building has been completed and another is scheduled to be started this month. Employment was reported off several hundred from last year, but is now holding steady around 2500.

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Sales Offices In Principal Cities

Reports Record Profits On Lower Sales Volume

Chicago

• • • Last year was a record year for Crane Co. from the standpoint of sales profits, but a slight reduction in the dollar volume of goods sold in the first few months of this year resulted in a substantial decline in earnings, John H. Collier, chairman, and J. L. Holloway, president, told stockholders at the annual meeting here.

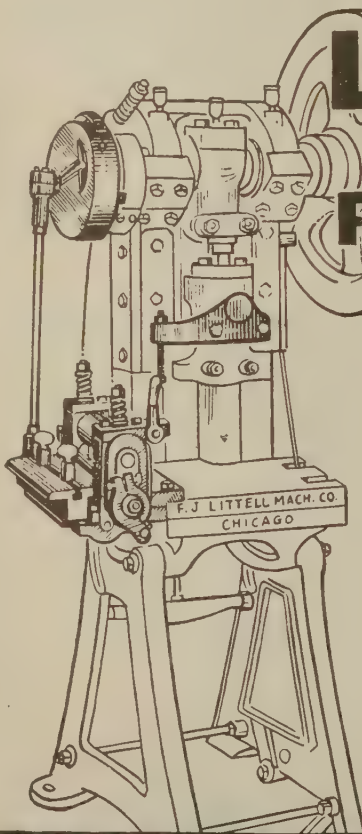
Net income of the company and its domestic subsidiaries amounted to \$16,695,719 in 1948. This was equal to \$6.86 a share of common stock outstanding. In 1947 the company earned a net income of \$13,244,072 to equal the \$5.39 a common share. Officials told stockholders that depreciation charges based on original continue inadequate considered in relation to current replacement costs. For this reason the company set aside \$1,029,000 of the 1948 earnings, before transfer to earned surplus, as a provision toward the excess of anticipated replacement cost of the original machinery and equipment.

H. H. Bunchman, treasurer, said it was too early to determine whether this was a seasonal dip or definite decline.

Announces New Members

Cleveland

• • • Gray Iron Founders' Society, Inc., has announced the following new members: Lincoln Foundry, Lincoln, Ill.; Haley-Warren, Inc., Atlanta; Empire Foundry Co., Denver; Dodge Mfg. Corp., Mishawaka, Ind.; Peru Foundry Co., Peru, Ind.; International Harvester Co., Milwaukee; Climax Engineering Co., Clinton, Iowa; McDonough Foundry & Machine Co., McDonough, Ga.; Spitz Foundry, Hastings, Neb.; Chorlton Foundry Co., Inc., Somerset, Mass.; Dick Foundry, Arcadia, Ohio; Harris Foundry & Machine Co., Cordele, Ga.; E. W. Bliss Co., Toledo; The Electron Corp., Littleton, Colo.; American Cast Products, Inc., Orrville, Ohio; Virginia Foundry Co., Roanoke, Va.; Omaha Semi-Steel Foundry Co., Inc., Omaha, Neb.; Miller Foundry Co., Columbus, Ohio, and O. S. Kelly Co., Springfield, Ohio.



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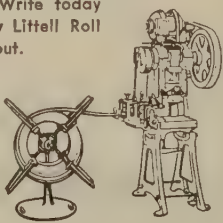
ROLL FEEDS

SAVE your operators' fingers! Accidents mean lost production, lowered morale. Littell automatic Roll Feeds prevent most accidents on your punch presses.

Littell automatic Roll Feeds eliminate any need for the operator to place his hands between the punch and the die. The Roll Feed moves coil stock through the press with greater combined speed and precision than is possible manually. Yet the operator is not endangered. That's why the lowest insurance rates are given to presses equipped with automatic feeds. Add this saving to your profits.

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Community Helps Burned Out Firm to Stay Open For Regular Business

Toledo, Ohio

••• As officials and employees of Prestole Corp. watched Toledo firemen put out the last sparks of a fire that apparently meant the end of a \$1,000,000 fastening device business early in the morning of Mar. 17, few imagined that the company would be back in business within a few hours.

At 9:00 a. m., John C. Wright, Prestole vice-president and treasurer, called a meeting of executives, foremen and office employees at the Toledo Club. At 10:30 Prestole was back in business.

Special telephone lines were strung into the home of the plant receptionist, who with her assistant took the calls which come into Prestole daily. They called all the Prestole field representatives and sent telegrams to customers, advising about the fire and promising further information on orders and schedules as soon as available.

By noon, construction workers were searching the ruins for records, parts and dies. Most of the records were intact, although partially burned and watersoaked. Salvaged tools and dies were transported to employees' garages where they were carefully cleaned, identified and sorted.

As word of the fire spread through the city, offers of help poured in from friendly Toledo firms. William Longhran, general manager, Production Metal Stamping Co., and Fred Hansen, general manager, N. M. Hansen Mfg. Co., put their plant facilities at Prestole's disposal.

Shakeproof, Inc., of Chicago, a Prestole competitor, offered assistance.

Steel companies gave Prestole top-priority on materials. Office equipment firms in downtown Toledo rushed desks, files and other necessities to the Hillcrest Hotel, where by Saturday offices were set up and employees resumed their work.

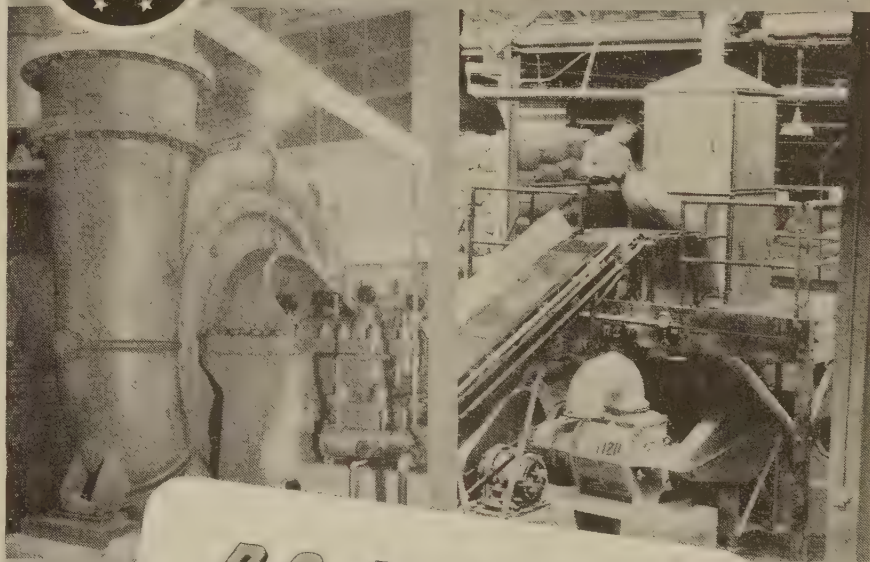
As dies were recovered and cleaned, they were sent to the Hansen plant where they were torn down, checked for usability



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Type RCD Rotary Positive Blower, used for conveying. Capacity 1,500 CFM.



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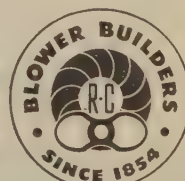
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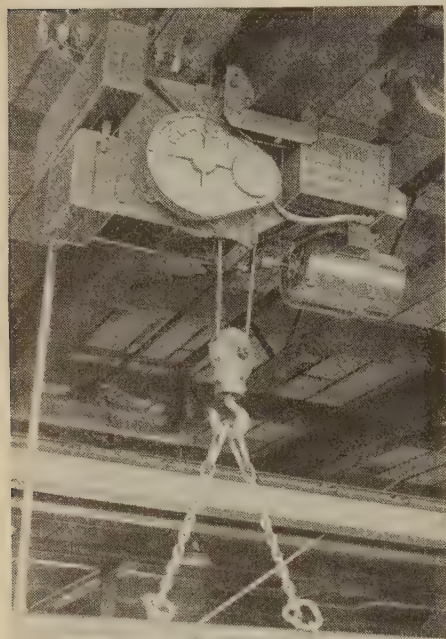


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NEWS OF INDUSTRY

and then rushed to Production Metal Stamping Co. to be set up in machines.

By Sunday night, March 20, 32 active dies and countless tools had been cleaned, checked and approved for production. Within a week Prestole had three 8-hr shifts working at full production and customer orders were being shipped on schedule.

While this miraculous recovery was taking place, representatives of many customers flew to Toledo to determine the status of their orders and shipping schedules. The conditions they saw relieved them of any worry about getting fasteners, and they left Toledo not only impressed by the manner in which Prestole dug itself out of the ruins, but also by the friendly spirit with which other Toledo firms offered help to the company.

Auto Freight Rhubarb Is Approaching a Decision

Detroit

••• A titanic 10-year struggle between Ford and General Motors vs. six other automobile producers—Chrysler, Nash, Hudson, Packard, Studebaker and Willys-Overland—charging unfair freight rates is nearing a climax.

A final decision by the Interstate Commerce Commission is expected in the near future. The companies alleging discrimination in freight rates have submitted briefs to the Interstate Commerce Commission purporting to show that General Motors and Ford pay only 25 to 40 pct of the first-class freight charges for transportation by rail on newly assembled cars from branch plants. Meanwhile, the remaining manufacturers who do not operate assembly plants on the same scale have to pay up to 85 pct of first-class rates for new car shipments out of the Detroit area. About 25 pct of all Chrysler new car shipments out of Detroit are being made by rail, according to company officials.

It is also contended that the use of a percentage basis in making recent freight increases has had the effect of increasing still further the differential between rates paid by GM and Ford and the rates

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paid by other competing car companies.

The present struggle which is being led by Chrysler Corp. had its inception many years ago. Originally, automobiles were shipped as first-class freight from all plants, regardless of location. In 1931 it is alleged by the complainants that freight rates from assembly plants were set at a figure substantially below the Detroit rate. The reason for the lower rate, according to railroad sources, was to meet competition from trucks.

General Motors and Ford spokesmen have declined to comment on the situation.

Members of the "Chrysler group" ship most of their cars from four main assembly points at Detroit, Toledo, Kenosha and South Bend. The plaintiffs contend that GM and Ford have much more favorable rates from assembly plant areas. For example, a chart to be used as evidence before the Interstate Commerce Commission shows that last May it cost \$2.78 per hundred pounds to ship an assembled car by rail from Detroit to Birmingham, Ala. From Ford's Atlanta plant to Birmingham, however, the charge was only 56¢ per hundred pounds. Cost of parts shipments from Detroit to Atlanta would have to be added, of course, to compute the competitive advantage now enjoyed by GM and Ford over their rivals.

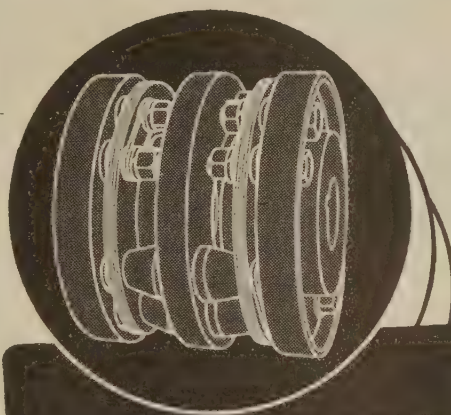
A comparison was offered by the "Chrysler group" showing that the freight rate from Detroit to Birmingham is now 43 pct above the tariff in 1929. During the same period, the Atlanta rate showed a decrease of 45 pct. Similar charts showing unfavorable rate comparisons were presented for Detroit and St. Louis to Little Rock, Ark.; and from Kenosha and Baltimore to Pittsburgh.

Chrysler has charged that railroads hauling a large tonnage of Ford and GM parts and supplies have been opposing their efforts to get "fair rates all around." It is also charged that artificially high freight rates in effect hold an umbrella over truck rates out of the Detroit area, adding further to the Chrysler Group's production costs.

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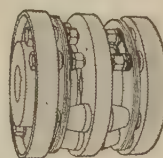
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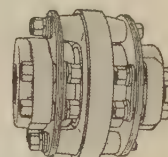
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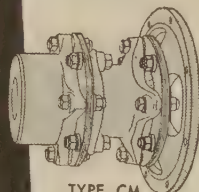
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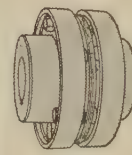
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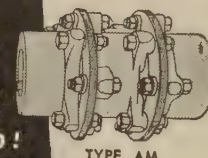
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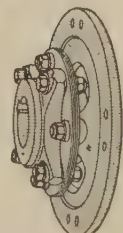
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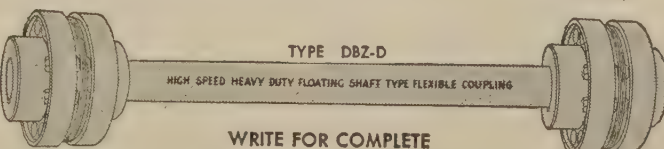
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THE KEY to lower spring costs is in design and manufacture. Perhaps in your own case, a small modification in design which would not affect your product's performance would make it possible to substantially reduce the cost. Or maybe your springs are being made in several operations when one would suffice. Skilled springmakers here at Accurate have the experience—the "know-how"—to recognize such conditions *and to correct them!* Our manufacturing facilities are modern and complete—we have the equipment to do the job right, at the lowest cost to you.

We would welcome the opportunity to show you what we have done for others and point out what we can do for you. Write, wire or phone, today; your inquiry will receive prompt attention.



A dependable source of supply!

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Springs, Wire Forms, Stampings

Right-Wing Auto Workers Win At Ford's Elections

Detroit

• • • Right-wing elements of the UAW-CIO led by Walter Reuther have won another sweeping victory over their left-wing opponents in the recent Ford elections.

In a spirited contest in which more than 42,000 Ford workers cast ballots, Thomas Thompson, incumbent, pulled 21,432 votes to 13,344 for Virgil Lacey, his left-wing opponent.

In addition to the election of Thompson, other Reuther-backed candidates were returned to office with the exception of two trustees. Run-off votes will be required to settle the results of the trustee contest.

Reuther-supported candidates campaigned on a program calling for \$100 a month pension and a 5 pct payroll fund for Social Security and wage adjustments. The left-wing candidates campaigned for a 30¢ wage increase.

It will be recalled that a year

ago a proposed pension plan for Ford workers was badly defeated at the polls. A year ago, however, the pension plan was sponsored by the left-wing elements of the union.

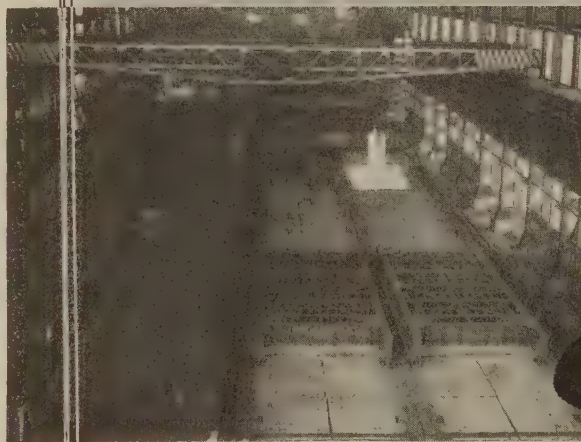
Sets an All-Time Steel Ingot Production Record

Bethlehem

• • • An all-time record for steel ingot production was made by Bethlehem Steel in March of this year, E. G. Grace, chairman, recently announced. During that month the Bethlehem steel plants turned out a total of approximately 1,294,000 net tons of ingots. The previous record, 1,264,762 net tons, was made in January of this year.

Individual ingot production records were also made during March at the plants at Bethlehem and Steelton, Pa., Lackawanna, N. Y., and Los Angeles. In addition, numerous records were achieved by many of the rolling mills and other operations at many of the Bethlehem plants.

FOR IMPROVED INGOT HEATING



F.E.I.
SOAKING PITS

The new style regenerative soaking pits designed by Furnace Engineers, Inc., will increase your output of heated ingots and substantially lower your fuel and maintenance costs. Fired by a mixture of cold and clean blast furnace gas enriched with coke oven gas, the soaking pits provide higher temperatures in the preheated air.

F.E.I.'s new regenerative soaking pits include all the latest improvements: most modern instrumentation, double-pass checkers, Isley controls, flat door arches and flat checker arches. They operate with the utmost efficiency and dependability.

An F.E.I. representative will be glad to provide you with full details at your convenience. Write or call today.

FURNACE ENGINEERS, INC.
1554 W. Liberty Ave. Pittsburgh 26, Pa.

Enamel Products Company Is Reorganized in Ohio

Lima, Ohio

• • • At a recent reorganization meeting of Davidson Enamel Products, Inc., Lima, Ohio, L. W. Ecke, plant superintendent and secretary, was elected president to succeed F. S. Davidson who died Jan. 25.

Mr. Ecke assisted with Mr. Davidson in the company's organization in 1926, and has been plant superintendent and secretary since that time. He is recognized as one of the country's outstanding enamelists, and during World War II developed a method of operation which reduced the cost of 105 mm shell container cases 40 pct under the original contract price.

R. J. DeVoe, executive vice-president, was reelected and was also named treasurer. Mr. DeVoe has been executive vice-president since 1947 when he joined the company. Others elected were Harry R. Meredith, secretary; A. C. Weierich, vice-president, architectural division; John W. Timmermeister, assistant secretary and treasurer and W. J. Behrens, comptroller.

Follansbee Steel Net Dips

Pittsburgh

• • • Net earnings of Follansbee Steel Corp. for 1948 were \$2,339,996, amounting to \$5.26 per share on 442,228 shares of capital stock outstanding, it was revealed in the annual report to stockholders. This compared with \$2,841,568 for 1947 or \$8.22 per share on 345,688 shares outstanding at the end of that period. It was pointed out in the annual report that 1947 earnings covered operations of Follansbee Steel only, whereas 1948 earnings figures were on a consolidated basis, including Federal Enameling & Stamping Co., an acquisition made during the early part of 1948.

Net sales for the year on a consolidated basis were \$36,739,240, an increase of 28 pct over 1947 sales of \$28,715,064 for Follansbee Steel Corp. alone.

M. A. Follansbee, president, pointed out in the report that the decline in net earnings of \$501,572 last year was due to certain contract wage adjustments and to inventory write-offs in raw materials, semi-finished and finished products.



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**MILFORD
DUPLEX**
HACK SAW BLADE
*for every hand-cutting
need!*

**THE ONLY HAND HACK
SAW BLADES WITH
EASY STARTING TEETH**

to give you these advantages

- Starts cut at any angle
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- Will not slip off cutting line
- Wear distributed full length of blade

No matter what you need to cut . . . or how . . .
or where . . . you'll find that MILFORD'S know-
how . . . accumulated in over 70 successful years
of exclusive saw manufacturing experience . . .
has produced the *right* blade for the job . . .

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All-Hard Standard Steel	Yellow Label
Safety Standard Steel	Brown Label
All-Hard Rezistor	Orange Label
Flexible Rezistor	Silver Label
Tungsten High Speed Steel	Red Label

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MILFORD hack saw
and band saw
blades.

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**IT ALWAYS PAYS TO
SPECIFY MILFORD!**

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Saw Specialists Exclusively for over 70 Years
NEW HAVEN 5, CONNECTICUT, U. S. A.

PROFILE AND
BAND SAW BLADES
REZISTOR AND DUPLEX
HACK SAW BLADES

Machine Tool Industry Hit By War Dept. Renegotiation Rules

• • • Important segments of the machine tool industry were still punch-drunk this week following a blow delivered by the War Dept., Apr. 7, in the form of the 1948 renegotiation regulations, which cover the machine tool business like a tent.

Part 423, title 34, indicates that machine tools and the agent's commissions involved, in other words, the machine tool dealer's commissions, are definitely subject to the act, which was effective July 1, 1948. Almost everything that has anything to do with a government contract is renegotiable, down to packaging and including even transportation in the contractor's plant, which takes in materials handling equipment. Contracts between builder and dealer are cited specifically in this section as typical of the producer-agent relationships that are subject to renegotiation.

Otherwise, start of the second quarter for the machine tool industry was marked by a reluctant market in major sales sectors this week, despite preliminary reports on the industry's March performance which indicated a 20 pct increase in new firm orders of the February total, lower cancellations, higher backlogs and an increase in shipments over the February volume.

As a parallel, contract tool and die shops sources report that new orders, shipments, backlog, and employment are down, but add that sales invoiced during February were 96 pct of the corresponding month of 1948.

This spotty and rather uncertain state of affairs gives pause to the joint survey by the Dept. of Commerce and the Securities Exchange Commission, recently made public; indicating that business intends to spend \$18,300 million on new plant and equipment this year. This figure would be \$900 million under record 1948 plant and equipment expenditures.

Estimated first quarter spending of some \$4,170 million would be

ECA Buying Continues Limited In Cleveland Area; Prices Remain Unchanged

• • •

about \$500 million higher than in the comparable period last year. Most of the 1949 decline, according to this survey, is expected to occur in the second quarter. One reason is that manufacturing generally has eased off expansion as production requirements are met.

Superficially, such spending would seem to portend a boom for the machine tool industry. However, in 1948, the machine tool industry's total shipments were slightly under \$300 million.

In Detroit there are bright spots in the machine tool picture, but the beam of promise is narrow and a sharp and optimistic eye is required to find it. Auto production is at postwar peak here but machine tool buying is fairly close to the low spot for the postwar era, according to several sources. Some substantial tooling orders for the plastic industry have been reported, but this seems to be an exception.

The Dodge program is currently standing still and there are no indications that the Detroit gear program, believed to be for a Studebaker transmission, is any nearer the ordering stage.

There is only limited ECA buying in this area, but if one is a subscriber to the theory that a slump in business may mean a strong pickup in government ordering, this situation could be quickly reversed.

No major changes in prices have been reported. "We're taking the frills off," one source told THE IRON AGE, "but our basic quotations are being held."

Use of GM's hydra-matic transmission by Ford now seems reasonably certain, although some sources indicate that there may still be some hurdles in the way

of adoption for Lincoln and, in all probability, Mercury.

In Torrington, Conn., Hendey Machine Co., which has been attempting to enlist government aid in maintaining work schedules, announced Apr. 4, a major reduction in operations calling for a 3-day work schedule every other week.

Edgar G. Seybold, vice-president-treasurer of Hendey, stated that not all departments will be affected by the cut in the work week and that work will be staggered so that operations at the plant will not be completely upset.

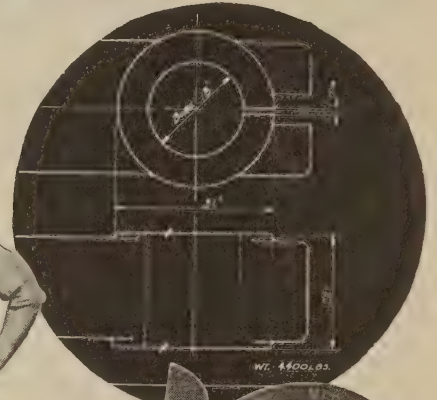
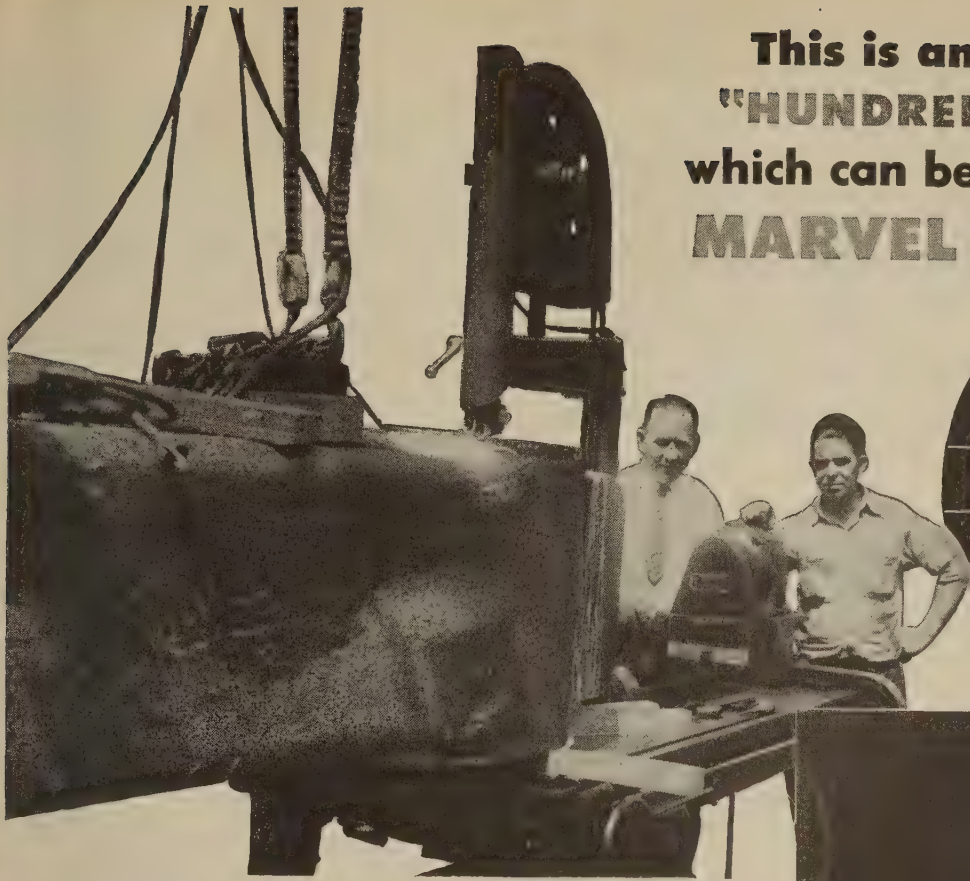
About 25 plant employees have been notified that unless orders are received, their services will not be needed after Apr. 13. The decrease in work week and in the number of employees will leave about 225 workers on the company's payroll.

Hendey recently appealed to Rep. James T. Patterson (R.) to intercede to obtain government contracts for machine tools now being manufactured and exported by Marshall Plan countries.

In Cleveland, contract negotiations between Warner & Swasey Co. and representatives of District 54, International Assn. of Machinists, which is on strike at the Warner & Swasey plant here, were recessed indefinitely last week. Both parties were deadlocked on wages and other issues that have blocked efforts for settling the work stoppage that has kept 1800 employees idle since Dec. 27. C. Russell Turner, federal labor commissioner, said negotiations broke off with an understanding that further meetings would be subject to his call in the immediate future.

Mr. Turner said he met separately with representatives of the company and the union and found neither side inclined to change its position. The union is seeking a 10¢ hourly wage increase and six paid holidays. A proposed contract submitted recently by Warner & Swasey Co. was rejected.

**This is another of the
"HUNDREDS OF JOBS"
which can be done only on a
MARVEL Band Saw!**



**MARVEL BAND SAW saved
these two 4400 lb. castings**

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the \$64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of \$3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

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**These exclusive MARVEL Features
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1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic blade tension.
5. Built-in coolant system.
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5700 BLOOMINGDALE AVENUE CHICAGO 39, ILLINOIS



Recent Reductions In Lead And Zinc Fail To Tempt Consumers

New York

... The fifth reduction in the price of lead in a month, a reduction of 6½¢ per lb, and the second reduction in zinc in 2 weeks, a total of 2½¢, have metals consumers backing away from the markets. So far the lower prices have not been effective in building heavier demand.

The copper market has also been affected by the weakness in the other metals. Consumers are buying metals now only for their immediate and urgent needs, as indicated by requests on producers for immediate delivery and to have cars traced.

By this time there is no question of the lower order of business in fabricated metal products. Under these circumstances required working inventories are lower and consumers have taken advantage of more plentiful supplies of metals to reduce their high-priced inventories. If it had not been for the long Utah strike, there is no doubt that the copper market would have been lower by this time despite the tonnages required by the stockpile.

There were no further reductions in the scrap market last week, except for a few type metal grades, largely because the latest reductions in lead and zinc had already been anticipated. There is still a general apathy toward the scrap market in the East, although it was reported that a volume of buying in the Midwest served to raise the price of copper and brass grades there. Brass mill scrap buying prices were dropped by a fraction of a cent to adjust for the lower zinc price. Prices of brass

Easier Supply Causes OIT To Relax Export Quotas In Metals and Products

o o o

mill products have also been revised downward.

The ingot markets are still inactive, and prices of aluminum ingot dropped last week by 1¢ per lb. There have been no changes in the published prices of brass ingot, but it is reliably reported that some distressed tonnages have been sold at appreciably lower prices.

The better supply of nonferrous metals has been responsible for action taken by the Office of International Trade to remove fixed quotas of 18 metals and minerals for export during the second quarter.

Exporters of these commodities, however, must continue to obtain validated OIT licenses, and to observe applicable export regulations. In applying for licenses, shippers must certify that they hold accepted orders from foreign consignees, and state the uses to which the products will be put in the countries to which they are exported.

OIT officials said that a substantial improvement in the supply of the nonferrous commodities is responsible for the removal of the quota restrictions. The over-all supply is not yet adequate to permit removing the commodities from the Positive List. (Commodities not on the Positive List may be exported without validated li-

censes to destinations outside the "R Group" countries of Europe and adjacent areas.)

In addition to removal of fixed quotas for these commodities, the quota for lead pigs, bars and anodes (including blocks and ingots) has been increased from 650 tons for the first quarter to 1200 tons for the second quarter.

The nonferrous metals, minerals and manufactures for which fixed export quotas have been removed for the second quarter of 1949, and quotas in effect during the first quarter of the year, are:

COMMODITY	1st Quarter Quota Net Tons
Copper rods and bars	500
Brass and bronze scrap	5,000 ¹
Brass and bronze pipes and tube.....	1,000
Brass and bronze pipe fittings.....	300
Brass and bronze wire, bare and insulated	700
Lead sheets and pipes (include strips and bands)	600
Type metal	250
Type (include multigraph type)	200
Antimonial lead	200
Foil, lead and lead-tin (less than 0.006 in. in thickness)	5
Lead plate, or battery plate, not assembled as complete battery units..	125
Lead castings; calking yarn; circles; disks; flanges; plugs; powder; rings; metal packing rings; roof flanges; sash weights; shots; shrapnel; sinkers; tape; washers; weights, except scale weights; wire; and wool	250
Babbitt metal	250 ²
Bismuth matte, slimes, residues, and bullion	Closed
Copper alloys in primary forms, except brass, bronze, nickel or gold...	100
Insulated copper wire and cable: Building wire and cable (including rubber-covered building wire).....	1,400
Weatherproof and slow burning wire.	700
Insulated copper wire, n.e.s., except rubber-covered lamp cord	4,000

¹ Tin content not to exceed 5 pct for any application.

² Tin content not to exceed 100 short tons.

Opens Second Brass Mill

Los Angeles

... Southern California's second major copper and brass mill will be opened formally on Apr. 18 by Revere Copper & Brass Inc.

As reported earlier in THE IRON AGE, the plant has been in test production since March. It follows the establishment of Phelps - Dodge here. American Brass has purchased land nearby to become the third segment of the new western industry.

Nonferrous Metals Prices

	Apr. 6	Apr. 7	Apr. 8	Apr. 9	Apr. 11	Apr. 12
Copper, electro, Conn.	23.25-	23.25-	23.25-	23.25-	23.25-	23.25-
Copper, Lake, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Tin, Straits, New York	23.625	23.625	23.625	23.625	23.625	23.625
Zinc, East St. Louis	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Lead, St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	23.25 to 23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Iridium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$87 to \$90
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$72 to \$75
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.70
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	17.50*
No. 120	17.00*
No. 123	16.50*
80-10-10 ingot	
No. 305	23.75
No. 315	20.75
88-10-2 ingot	
No. 210	30.50
No. 215	27.50
No. 245	21.00*
Yellow ingot	
No. 405	14.50*
Manganese bronze	16.00
No. 421	21.50
* F.o.b. Philadelphia.	

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	21.50-21.75
0.60 copper, max.	21.25-21.50
Piston alloys (No. 122 type)	18.25-18.75
No. 12 alloy (No. 2 grade)	17.75-18.00
108 alloy	18.25-18.75
195 alloy	18.75-19.25
13 alloy	21.25-21.75
AXS-679	18.25-18.75

Steel deoxidizing aluminum, notch-bar granulated or shot.

Grade 1—95 pct-95 1/2 pct	19.50-19.75
Grade 2—92 pct-95 pct	18.50-18.75
Grade 3—90 pct-92 pct	17.50-17.75
Grade 4—85 pct-90 pct	16.50-16.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	38.64
Electrodeposited	34%
Rolled, oval, straight, delivered	37.34
Ball anodes	38%
Brass, 80-20	
Cast, oval, 15 in. or longer	35%
Zinc, oval, 99.99	
Ball anodes	24.00
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48.00
Copper sulfate, 99.5 crystals, bbls	9.10
Nickel salts, single or double, 4-100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	
Zinc sulfate, 25 pct, granules, bbls, frt allowed	

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: 1/4 in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 45.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, 1/4 to 1 1/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, 3/8 to 1 1/2 in., 11S-T3, 37.5¢ to 35.5¢; 3/8 to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 9/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2 1/2 to 3 3/8 in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, 1/4 in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, 1.12-1.31; 24, 1.62-1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., 1/4 to 0.311, 58¢; 1/2 to 3/4, 46¢; 1 1/4 to 1.749, 43¢; 2 1/2 to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., 1/4 to 0.311, 61¢; 1/2 to 0.749, 48¢; 1 1/4 to 1.749, 44¢; 2 1/2 to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb. per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb. per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb. per ft, per. up to 19.5 in., 44¢; 4 to 6 lb. per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 to 5/16, \$1.14; 5/16 to 3/8, \$1.02; 3/8 to 1/2, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, 3/8 to 7/16, 85¢; 5/8 to 3/4, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, 3/4 to 1 1/4, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.18
Copper, hot-rolled		33.03	
Copper, drawn		34.28	
Low brass	38.08		35.17
Yellow brass	36.78		33.77
Red brass	38.55		35.64
Naval brass	33.94	32.69	38.63
Leaded brass		28.22	
Commercial bronze	39.29		36.63
Manganese bronze	37.53	36.03	42.13
Phosphor bronze, 5 pct			56.05
Muntz metal	33.49	32.24	36.68
Everdurd, Herculoxy, Olympic, etc.		40.67	41.73
Nickel silver, 10 pct	45.97	46.44	44.22
Architectural bronze	32.26		

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21 1/2	20%
Yellow brass	18	17 1/2
Red brass	19%	18%
Commercial bronze	19%	19%
Manganese bronze	17 1/2	16 1/2
Leaded brass rod ends	17 1/2	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper, wire	16.00
No. 2 copper, wire	15.00
Light copper	14.00
Refinery brass	14.00*
* Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

Nc. 1 copper, wire	16.00
No. 2 copper, wire	15.00
Light copper	14.00
No. 1 composition	11.00
No. 1 comp. turnings	10.50
Rolled brass	9.50
Brass pipe	10.00
Radiators	9.50
Heavy yellow brass	8.50

Aluminum

Mixed old cast	9.50
Mixed old clips	9.50
Mixed turnings, dry	8.00
Pots and pans	9.50
Low copper	13.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	14 1/2 — 15
No. 2 heavy copper and wire	13 1/2 — 14
Light copper	12 1/2 — 13
Auto radiators (unsweated)	8 1/4 — 8 1/2
No. 1 composition	9 1/4 — 9 1/2
No. 1 composition turnings	9 — 9 1/4
Clean red car boxes	8 1/2 — 8 3/4
Cocks and faucets	8 1/4 — 8 1/2
Mixed heavy yellow brass	7 — 7 1/4
Old rolled brass	8 1/4 — 8 1/2
Brass pipe	8 3/4 — 9
New soft brass clippings	12 — 12 1/2
Brass rod ends	9 1/2 — 9 3/4
No. 1 brass rod turnings	8 1/2 — 8 3/4

Aluminum

Alum. pistons and struts	5 — 5 1/2
Aluminum crankcases	6 3/4 — 7
2S aluminum clippings	11 1/2 — 12
Old sheet and utensils	6 3/4 — 7
Borings and turnings	4 — 4 1/2
Misc. cast aluminum	6 3/4 — 7
Dural Clips (24S)	6 3/4 — 7

Zinc

New zinc clippings	9 — 9 1/4
Old zinc	6 3/4 — 7
Zinc routings	4 1/4 — 4 1/2
Old die cast scrap	4 1/4 — 4 1/2

Nickel and Monel

Pure nickel clippings	20 — 21
Clean nickel turnings	15 — 16
Nickel anodes	20 — 21
Nickel rod ends	19 — 21
New Monel clippings	15 1/2 — 16 1/2
Clean Monel turnings	10 — 11
Old sheet Monel	12 — 13
Old Monel castings	10 — 11
Inconel clippings	13 — 14
Nickel silver clippings, mixed	7 1/2 — 8
Nickel silver turnings, mixed	6 1/2 — 7

Lead

Soft scrap lead	8 — 8 1/2
Battery plates (dry)	4 1/4 — 4 1/2

Magnesium Alloys

Segregated solids	8 — 9
Castings	4 1/2 — 5 1/4

Miscellaneous

Block tin	77 — 79
No. 1 pewter	58 — 60
No. 1 auto babbitt	42 — 44
Mixed common babbitt	10 1/2 — 11
Solder joints	14 — 15
Siphon tops	45 — 47
Small foundry type	12 1/2 — 13
Monotype	11 1/2 — 12
Lino. and stereotype	11 — 11 1/2
Electrotype	8 1/2 — 9
New type shell cuttings	12 1/2 — 13
Hand picked type shells	6 — 6 1/2
Lino. and stereo. dross	6 1/2 — 7
Electro. dross	4 1/2 — 5



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Trend Down; Prices Lower; Market Weak

New York

... This week the scrap market followed last week's downward trend with price declines for most items. There are still no large tonnage orders and some quotations only represent an appraisal of the market. Consumers are showing little interest in buying anything at any price at the present time.

THE IRON AGE scrap composite price dropped \$2.59 per gross ton to \$23.58 per gross ton. This represents a drop of \$19.42 per gross ton since the first of the year. Prices for No. 1 heavy melting steel are: Pittsburgh, \$24.50 to \$25.00; Chicago, \$22 to \$23; and Philadelphia, \$23 to \$24.

Prices in all areas slipped again but not as bad as during the previous week. Chicago registered the greatest drop in No. 1 heavy melting with prices down \$5. Brokers were willing to sell but the consumers showed scant interest to buy any large tonnages or make commitments for future delivery.

High priced mill inventories are still one reason for today's declining prices. Future business also has a depressing effect on the scrap market, especially with declining sales and a small backlog of old orders.

This has been the "gloomiest" week for brokers in many years. The downward spiral has not stopped and there is no heavy mill buying to support some bottom market level. Brokers have few orders, hardly any new commitments, and are waiting, probably for still lower quotations.

Meanwhile talk of the probability of a declining ingot rate, and possible future pressure on base prices of steel, was not having a buoyant effect on the scrap market. Some sources in the trade indicated a belief that recent lack of interest on the part of consumers was an indication that they had been discounting a future drop in demand for steel products.

PITTSBURGH—On appraisal of all market factors, including sales and the law of diminishing returns, the top price of No. 1 heavy melting steel was \$2 weaker, while the top of No. 2 steel was

off \$1 a ton this week. Shoveling turnings, which resisted last week, dropped \$3 a ton this week and cast grades lost \$2 to \$3 a ton. As was the case last week, Pittsburgh's normal supply areas are closed to it at these prices because of freight rates. A typographical error was made in reporting the price of No. 2 heavy melting steel in last week's issue. The quotation should have read \$24.00 to \$25.00.

CHICAGO—Last week saw a continued decline of practically all items on the list as another \$5 drop was recorded. New buying was light, but legitimate offers to sell were plentiful. Those that bought reported that brokers were willing to sell at almost any price—"just name a price or make an offer, please." Bundled machine shop turnings and galvanized bundles have been dropped from the Chicago list. There is absolutely no market for these items and no price whatsoever can be quoted. Railroad specialties followed the rest of the market down. Last consumer prices on turnings are practically worthless, yard prices run from \$9 to \$11 on these items.

PHILADELPHIA—Scrap grades dropped another \$1 in this district last week. There was very little new business placed, but most factors in the market viewed it as weaker than the previous week. There is no doubt in anyone's mind that if several mills were to enter the market for heavy tonnages of most grades, prices would start upward. But inventories are being stretched out by reduced operations, and the trade is a little skeptical of an early buying wave.

CLEVELAND—Scrap prices here and in the Valley are in the worst decline since 1937 early this week. Mills and major foundries continue out of the market, which is apparently heading for about a \$20 top. Brokers and dealers are laying back with the orders they have, waiting to cover at the bottom dollar before the expiration date. In the meantime, overseas scrap continues to move into this area, which in a way prevents the price decline from being the buyer's delight it would otherwise be. This week's quotations are based on an appraisal of the market and consideration of other factors involved.

CINCINNATI—Scrap prices here continued their spectacular tumble and No. 1 grades were hanging precariously at \$21 early this week. Brokers report that major consumers are not interested apparently in anything at any price at this time. Machine shop turnings were quotable at \$11.50 which is close to the point where present freight rates will make it worthless to pick them up at remote points.

DETROIT—The scrap market is off again this week at Detroit, although a

few grades are hanging on by the narrowest of margins at last week's price levels. An indication of the lack of strength in the market is the almost complete absence of sales of any grade and reports of dealer buying from collectors at \$10 or lower. The first scheduled test of the market here will come at the end of the month when lists are again offered by large industrial plants.

NEW YORK—Scrap prices continued their downward trend and No. 1 heavy melting is off another 50¢ per gross ton. Business is the worst in years with no new commitments at the lower quotations. Brokers are hesitant to quote prices for fear that they will be too high. Meanwhile most consumers are showing no interest in lower prices, continuing to melt away high priced inventories.

ST. LOUIS—The already weak scrap market has been made weaker by the heavy offerings of brokers from other markets, whose lower prices have not brought them any business as mills prefer to stick to their old resources, but have forced local suppliers to meet the quotations of these outsiders. Result, a further decline of \$3 a ton on No. 2 at which some sales were made to the mills. No. 1 heavy melting steel, for which there has been no demand by the largest consumer of this item in the district is unchanged as that melter came into the market on the basis of present quotations. Previously for some time the only outlet was a melter who agreed to pay \$1 a ton above No. 2.

BOSTON—Great confusion prevails. Brokers have no definite price on some grades, and on others qualify quotations as "guesswork." It is generally felt business will develop if prices in Pittsburgh and elsewhere stabilize, but at the moment it is practically at a standstill. A few yards here have curtailed operations since the recent break in prices; result, yard accumulations have slumped. The limited number of foundries wanting cast are taking it in truckloads at former prices.

BIRMINGHAM—The scrap price trend is downward here for another week although quotations remain largely on an appraisal basis. Purchases are confined to small tonnages and dealers are making no effort to go out after material in the face of a slumping market. Republic Steel Corp. purchased some No. 2 heavy melting steel for \$22 and then withdrew temporarily from the market.

BUFFALO—Blast furnace scrap was a trifle firmer this week on sales involving a small tonnage of cast iron borings and mixed borings and short turnings at \$18, an advance of \$1 over last week's nominal prices. On the other hand, No. 1 heavy melting steel and low phos plates were \$1 lower, due to lack of demand. A light business was reported in cupola cast at \$30, but otherwise foundry grades were quiet.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$24.50 to \$25.00
RR. hvy. melting	25.50 to 26.00
No. 2 hvy. melting	23.50 to 24.00
No. 2 bundles	21.50 to 22.00
RR. scrap rails	30.00 to 31.00
Rails 2 ft and under	35.00 to 36.00
No. 1 comp'd bundles	24.50 to 25.00
Hand bldd. new shfts.	23.50 to 24.00
Hvy. steel forge turn.	24.50 to 25.00
Mach. shop turn.	17.00 to 18.00
Shoveling turn.	21.00 to 22.00
Mixed bor. and turn.	17.00 to 18.00
Cast iron borings	21.00 to 22.00
No. 1 mach. cast.	36.00 to 37.00
Mixed yard cast.	28.00 to 30.00
Hvy. breakable cast.	26.00 to 28.00
Malleable	36.00 to 37.00
RR. knuck. and coup.	32.00 to 33.00
RR. coil springs	32.00 to 33.00
RR. leaf springs	32.00 to 33.00
Rolled steel wheels	32.00 to 33.00
Low phos.	27.00 to 28.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00 to \$23.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	22.00 to 23.00
No. 2 dealers' bundles	17.00 to 18.00
Mach. shop turn.	14.00 to 15.00
Short shov. turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Mix. borings and turn.	14.00 to 15.00
Low phos. hvy. forge	29.00 to 31.00
Low phos. plates	27.00 to 29.00
No. 1 RR. hvy. melt.	25.00 to 26.00
Revolving rails	34.00 to 35.00
Miscellaneous rails	30.00 to 32.00
Angles & splice bars	34.00 to 35.00
Locomotive tires, cut	35.00 to 37.00
Cut bolster & side frames	34.00 to 36.00
Standard stl. car axles	39.00 to 40.00
No. 3 steel wheels	35.00 to 38.00
Couplers and knuckles	35.00 to 36.00
Rails, 2 ft and under	34.00 to 36.00
Malleable	25.00 to 26.00
No. 1 mach. cast.	30.00 to 32.00
No. 1 agricul. cast.	29.00 to 31.00
Heavy breakable cast.	27.00 to 28.00
RR. grate bars	23.00 to 24.00
Cast iron brake shoes	25.00 to 26.00
Cast iron car wheels	30.00 to 31.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$20.00 to \$21.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 bundles	20.00 to 21.00
No. 2 bundles	18.00 to 19.00
Mach. shop turn.	11.00 to 11.50
Shoveling turn.	11.00 to 11.50
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.00 to 11.50
Low phos. 18 in. under	25.00 to 26.00
No. 1 cupola cast.	34.00 to 35.00
Hvy. breakable cast.	25.00 to 26.00
Rails 18 in. and under	38.00 to 39.00
Rails random length	29.00 to 30.00
Drop broken	37.00 to 38.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$17.00 to \$18.00
No. 2 hvy. melting	14.00 to 14.50
No. 1 bundles	15.50 to 16.50
No. 2 bundles	13.50 to 14.50
Bushelings	14.00 to 14.50
Shoveling turn.	13.50 to 14.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	7.00 to 8.00
Cl'n cast chem. bor.	22.00 to 27.00
No. 1 machinery cast.	25.00 to 28.00
No. 2 machinery cast.	24.00 to 26.00
Heavy breakable cast.	16.00 to 17.00
Stove plate	20.50 to 21.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$17.00 to \$18.00
No. 2 hvy. melting	17.00 to 18.00
No. 1 bundles	17.00 to 18.00
New busheling	17.00 to 18.00
Flashings	17.00 to 18.00
Mach. shop turn.	13.00 to 14.00
Shoveling turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Mixed bor. & turn.	13.00 to 14.00
Low phos. plate	17.00 to 18.00
Heavy breakable cast.	13.00 to 17.00
Stove plate	16.00 to 17.00
Automotive cast.	23.00 to 25.00
No. 1 cupola cast.	19.00 to 23.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$23.00 to \$24.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles	23.00 to 24.00
No. 2 bundles	19.50 to 20.50
Mach. shop turn.	16.50 to 17.50
Shoveling turn.	20.00 to 21.00
Mixed bor. and turn.	14.50 to 15.50
Clean cast chemical bor.	24.00 to 25.00
No. 1 machinery cast.	27.00 to 29.00
No. 1 mixed yard cast.	25.00 to 27.00
Hvy. breakable cast.	27.00 to 28.00
Hvy. axle forge turn.	23.00 to 24.00
Low phos. acid openhearth	26.00 to 27.00
Low phos. electric furnace	28.00 to 29.00
Low phos. bundles	26.00 to 27.00
RR. steel wheels	30.00 to 31.00
RR. coil springs	30.00 to 31.00
RR. malleable	24.00 to 28.00
Cast iron carwheels	30.00 to 31.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 bundled sheets	21.00 to 22.00
Mach. shop turn.	15.00 to 16.00
Shoveling turnings	15.00 to 16.00
Locomotive tires, uncut	29.00 to 30.00
Mis. std. sec. rails	26.00 to 27.00
Steel angle bars	32.00 to 33.00
Rails 3 ft and under	33.00 to 34.00
RR. steel springs	31.00 to 32.00
Steel car axles	38.00 to 39.00
Brake shoes	29.00 to 30.00
Malleable	28.00 to 30.00
Cast iron car wheels	31.00 to 33.00
No. 1 machinery cast.	34.00 to 35.00
Hvy. breakable cast.	26.00 to 27.00
Stove plate	29.00 to 30.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	22.00
Long turnings	14.00
Shoveling turnings	15.00
Cast iron borings	18.00
Bar crops and plate	\$25.00 to 26.00
Structural and plate	25.00 to 26.00
No. 1 cupola cast.	33.00 to 34.00
Stove plate	30.00 to 31.00
No. 1 RR. hvy. melt.	23.00 to 24.00
Steel axles	37.00 to 39.00
Scrap rails	25.00
Revolving rails	30.00 to 32.00
Angles & splice bars	31.00 to 32.00
Rails 3 ft & under	31.00 to 32.00
Cast iron carwheels	30.00 to 31.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	21.00 to 22.00
Mach. shop turn.	15.00 to 16.00
Short shov. turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos.	27.00 to 28.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$17.50 to \$18.50
No. 2 hvy. melting	16.00 to 17.00
No. 2 bundles	14.50 to 15.00
Mach. shop turn.	9.00 to 10.00
Mixed bor. & turn.	9.00 to 10.00
Shoveling turnings	14.00 to 14.50
Machinery cast.	25.00 to 26.00
Mixed yard cast.	21.50 to 22.50
Heavy breakable cast.	20.00 to 21.00
Charging box cast.	20.00 to 21.00
Unstrp. motor blks.	18.50 to 19.50
Cl'n cast chem. bor.	23.00 to 24.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	21.00 to 22.00
Mach. shop turn.	16.00 to 17.00
Shoveling turn.	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Mixed bor. and turn.	17.00 to 18.00
Cupola cast.	29.00 to 30.00
Mixed yard cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Small indus. malleable	24.00 to 25.00
Low phos. plate	26.00 to 27.00
Scrap rails	34.00 to 35.00
Rails 3 ft & under	38.00 to 39.00
RR. steel wheels	34.00 to 35.00
RR. coil & leaf spgs.	34.00 to 35.00
RR. knuckles & coup.	34.00 to 35.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$23.00 to \$24.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles	23.00 to 24.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	23.00 to 24.00
Drop forge flashings	23.00 to 24.00
Mach. shop turn.	14.00 to 15.00
Shoveling turn.	18.00 to 19.00
Steel axle turn.	21.00 to 22.00
Cast iron borings	18.00 to 19.00
Mixed bor. & turn.	18.00 to 19.00
Low phos. 2 ft and under	26.00 to 27.00
No. 1 mach. cast.	34.00 to 35.00
Malleable	28.00 to 30.00
RR. cast.	31.00 to 32.00
Railroad grate bars	24.00 to 25.00
Stove plate	24.00 to 25.00
RR. hvy. melting	33.50 to 34.00
Rails 3 ft and under	35.00 to 36.00
Rails 18 in. and under	36.00 to 37.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	20.00
No. 1 bales	18.00
No. 2 bales	18.00
No. 3 bales	15.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$30.00 to 35.00
RR. hvy. melting	22.00
Rails	25.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	20.00
No. 1 bales	18.00
No. 2 bales	18.00
No. 3 bales	15.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$30.00 to 35.00
RR. hvy. melting	22.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$22.00
No. 1 & No. 2 bales	23.00
No. 3 bales	23.00
Elec. fur. 1 ft and under	30.00
No. 1 cupola cast.	\$30.00 to 32.00
RR. hvy. melting	22.00

HAMILTON, ONT.

Per gross ton delivered to consumer:

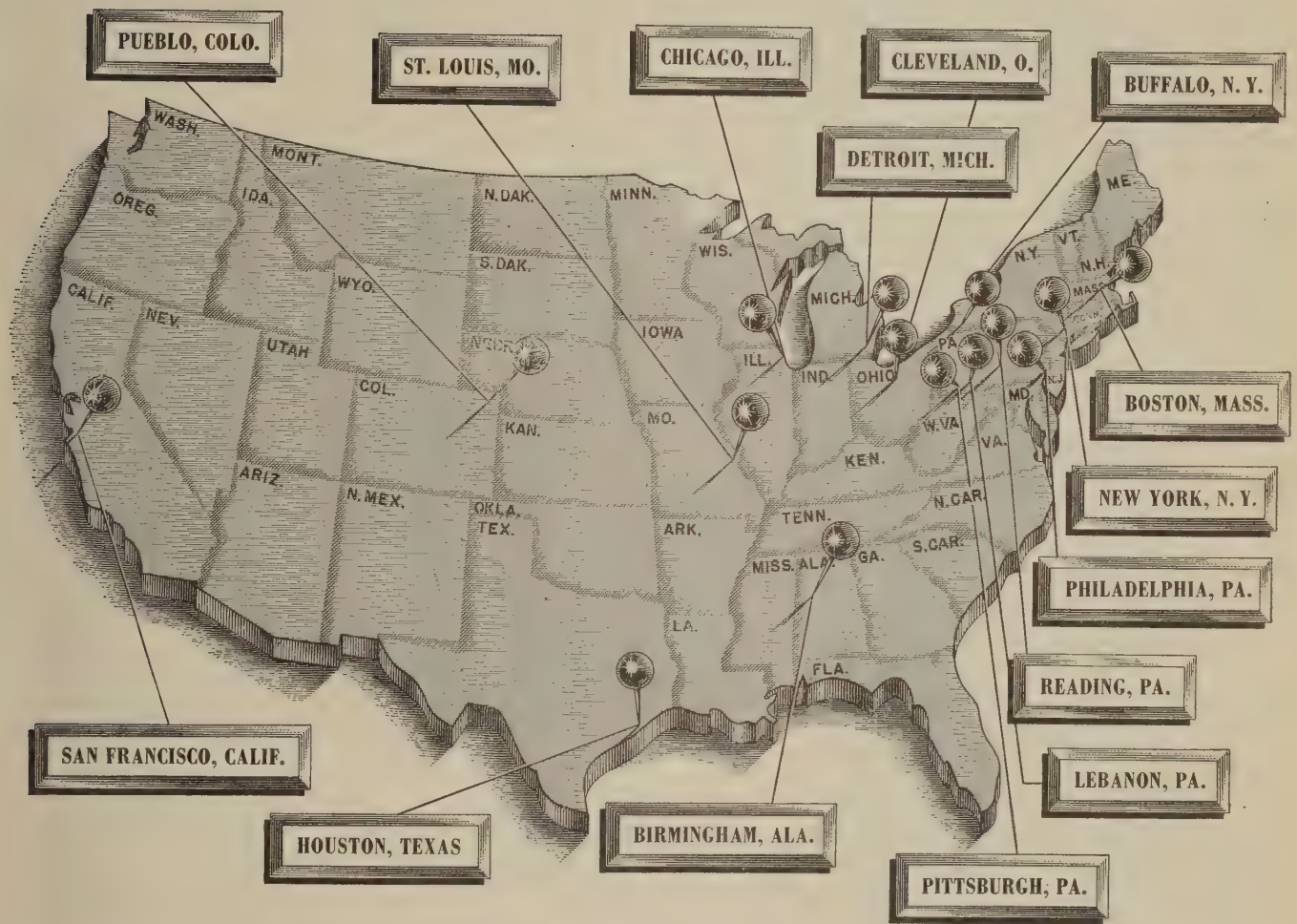
Cast grades f.o.b. shipping point:

Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, re-rolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	\$48.00 to 50.00*
No. 2 cast.	44.00 to 45.00*

*Ceiling Price.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Apr. 12, 1949	Apr. 5, 1949	Mar. 15, 1949	Apr. 13, 1948
(cents per pound)				
Hot-rolled sheets	3.25	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.25	3.265	3.265	2.80
Cold-rolled strip	4.038	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:

(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	6.00
Special coated mfg. ternes	6.65	6.65	6.65	5.90

Bars and Shapes:

(cents per pound)				
Merchant bars	3.35	3.35	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65

Wire:

(cents per pound)				
Bright wire	4.15	4.15	4.15	3.55

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.75
Light rails	3.55	3.55	3.55	3.10

Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00

Wire rod and Skelp:

(cents per pound)				
Wire rods	3.40	3.40	3.619	2.80
Skelp	3.25	3.25	3.25	2.90

Pig Iron:

(per gross ton)	Apr. 12, 1949	Apr. 5, 1949	Mar. 15, 1949	Apr. 13, 1948
No. 2, foundry, Phila.	\$50.56	\$51.56	\$51.56	\$44.61
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti*	49.47	49.46	49.46	43.28
No. 2, Birmingham	43.38	43.38	43.38	37.38
No. 2, foundry, Chicago†	46.50	46.00	46.00	39.00
Basic del'd Philadelphia*	49.76	50.76	50.76	44.11
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	62.46
Ferromanganese‡	161.40	161.40	161.40	145.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy page.

* Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap

(per gross ton)				
Heavy melt'g steel, P'gh.	\$24.75	\$26.50	\$36.75	\$40.25
Heavy melt'g steel, Phila.	23.50	24.50	35.50	41.50
Heavy melt'g steel, Ch'go	22.50	27.50	34.50	39.25
No. 1, hy. comp. sh't, Det.	17.50	20.50	32.50	35.50
Low phos. Young'n.	27.50	30.50	39.50	45.25
No. 1, cast, Pittsburgh	36.50	39.00	43.50	64.00
No. 1, cast, Philadelphia	28.00	30.50	40.00	65.50
No. 1, cast, Chicago	31.00	31.00	41.50	74.00

Coke, Connellsville:

(per net ton at oven)				
Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$12.50
Foundry coke, prompt	16.50	16.50	16.50	14.00

Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn.	23.375	23.375	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	94.00
Zinc, East St. Louis	15.00	15.00	17.50	12.00
Lead, St. Louis	14.80	15.80	17.80	17.30
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.93	42.93	42.93	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	33.00

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

Composite Prices . .

FINISHED STEEL (Base Price)

Apr. 12, 1949	3.74887¢ per lb.
One week ago	3.75197¢ per lb.
One month ago	3.75454¢ per lb.
One year ago	3.28244¢ per lb.

	HIGH		LOW	
1949....	3.76049¢ Jan. 1	3.74887¢ Apr. 12		
1948....	3.75700¢ July 27	3.22566¢ Jan. 1		
1947....	3.19541¢ Oct. 7	2.87118¢ Jan. 7		
1946....	2.83599¢ Dec. 31	2.54490¢ Jan. 1		
1945....	2.44104¢ Oct. 2	2.54490¢ Jan. 2		
1944....	2.30837¢ Sept. 5	2.21189¢ Oct. 5		
1943....	2.29176¢	2.29176¢		
1942....	2.28249¢	2.28249¢		
1941....	2.43078¢	2.43078¢		
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16		
1939....	2.35367¢ Jan. 3	2.26689¢ May 16		
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 13		
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4		
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10		
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8		
1934....	2.15367¢ Apr. 24	1.95757¢ Jan. 2		
1933....	1.95578¢ Oct. 3	1.75836¢ May 2		
1932....	1.89196¢ July 5	1.83901¢ Mar. 1		
1931....	1.99626¢ Jan. 13	1.86586¢ Dec. 29		
1929....	2.31773¢ May 28	2.26498¢ Oct. 29		

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON

....	\$46.66	per gross ton...
....	\$46.82*	per gross ton...
....	\$46.82*	per gross ton...
....	\$40.11	per gross ton...

*Revised.

SCRAP STEEL

....	\$23.58	per gross ton.....
....	\$26.17	per gross ton.....
....	\$35.58	per gross ton.....
....	\$40.33	per gross ton.....

	HIGH		LOW	
1949....	\$46.82 Jan. 4	\$46.66 Apr. 12		
1948....	46.91 Oct. 12	39.58 Jan. 6		
1947....	37.98 Dec. 30	30.14 Jan. 7		
1946....	30.14 Dec. 10	25.37 Jan. 1		
1945....	25.37 Oct. 23	23.61 Jan. 2		
1944....	\$23.61	\$23.61		
1943....	23.61	23.61		
1942....	23.61	23.61		
1941....	\$23.61 Mar. 20	\$23.45 Jan. 2		
1940....	23.45 Dec. 23	22.61 Jan. 2		
1939....	22.61 Sept. 19	20.61 Sept. 12		
1938....	23.25 June 21	19.61 July 6		
1937....	23.25 Mar. 9	20.25 Feb. 16		
1936....	19.74 Nov. 24	18.73 Aug. 11		
1935....	18.84 Nov. 5	17.83 May 14		
1934....	17.90 May 1	16.90 Jan. 27		
1933....	16.90 Dec. 5	13.56 Jan. 3		
1932....	14.81 Jan. 5	13.56 Dec. 6		
1931....	15.90 Jan. 6	14.79 Dec. 15		
1929....	18.71 May 14	18.21 Dec. 17		

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

FOR PRECISION TUBING WHATEVER THE . . .

SIZE

Precision Tubing is available in sizes which cover a range of 0.500 inches to 0.010 inches outside diameter, wall thicknesses down to 0.0015 inches. Through continuous hydrogen atmosphere annealing furnaces and tungsten carbide tooling, dimensions you specify within this range are held to extremely close tolerances.

SHAPE

Precision Tubing can be drawn to almost any shape desired and is often preformed to facilitate secondary operations. Round, rectangular, oval, or square—any dimensions you specify within Precision's standard ranges are produced to meet the most exacting dimensional requirements.

ALLOY

Precision's continuous endeavor to use only the best metal for any particular application has imbued it with a sound working knowledge of an almost limitless variety of non-ferrous alloys. Controlled production cycles make possible the correct temper, a clean smooth finish, and the precise uniformity so essential to long life.

**WHEN PRECISION COUNTS . . .
COUNT ON PRECISION**

PRECISION



TUBE CO.

SPECIALISTS IN ACCURATELY DRAWN TUBING AND METAL SHIELDED WIRE

Factory: 3824-26-28 TERRACE STREET • PHILADELPHIA 28, PA.

BRANCHES IN ALL PRINCIPAL CITIES

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 25¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas															
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio			Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS																
Carbon forging	\$50.00															
Alloy	\$50.00						(per net ton)									
BILLETS, BLOOMS, SLABS																
Carbon, rerolling ¹²	\$52.00				\$52.00	\$52.00	(per net ton)							\$52.00		
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)							\$61.00		
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)									
PIPE SKELP	3.25						3.25					Warren = 3.25				
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50				Worcester 3.70		3.40	4.05 ¹³ 4.20 ¹⁴	
SHEETS																
Hot-rolled ⁶	3.25	3.25	3.25	3.25	3.25	3.25 (Canton to 24 in.)	3.25 (to 24 in.)	3.25 (Pa. 3. 5)			Warren, Ashland = 3.25		3.45		3.95 ¹⁵	4.15
Cold-rolled ¹	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20			Pittsburg, Cal. 4.95	
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40		Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹⁵	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40			4.60	4.40		4.70			
Long ternes ² (10 gage)	4.80		4.80								4.80					
STRIP																
Hot-rolled ³	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25		3.45		4.00 to 4.25	4.65
Cold-rolled ⁴	4.00	4.15		4.00		4.00	4.00	4.00			New Haven 4.50 Warren = 4.00 to 4.25	4.20 to 4.50				5.55
TINPLATE																
Cokes, 1.50 lb. ⁵ base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95		Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.50	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price															
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price															
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price															
BLACKPLATE, h.e., 29 ga. ¹⁰	5.30	5.30	5.30					5.40			Warren, Ohio = 5.30					
BARS																
Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35		4.05 to 4.10	4.00
Reinforcing (billet) ⁷	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35		4.05 to 4.10	4.00
Cold-finished ⁸	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30				
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75			4.05	3.75		4.80 ¹⁴	4.75
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65		Massillon = 4.65		Worcester 4.95					
PLATE																
Carbon steel ¹¹	3.40 to 3.60	3.40	3.40	3.40 to 3.60	3.40 Cons	3.45 Cons	3.40 Cons	3.45 Cons	3.45 Coatesville = 3.75, Claymont = 3.65 Geneva = 3.40, Harrisburg = 4.95			3.65	3.45		4.30 ¹⁶	5.30
Floor plates	4.55	4.55		4.55					Conschocken = 4.55							
Alloy	4.40	4.40							Coatesville = 5.10							
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30, Geneva, Utah = 3.25					3.30	3.85 to 4.30	3.80
MANUFACTURERS' WIRE ⁹																
Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45					4.15	5.15 ¹³	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50					5.20	Duluth = 5.20-5.15	
PILING, Steel sheet	4.05	4.05				4.05										

PRICES

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel						Straight Chromium		
	301	302	303	304	316	347	410	416	430
Ingots, rerolling.....	12.75	13.50	15.00	15.50	22.75	20.00	11.25	13.75	11.50
Slabs, billets, rerolling.....	17.00	18.25	20.25	19.25	30.25	26.75	15.00	18.50	15.25
Forging discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	41.00	24.50	25.00	25.00
Billets, forging.....	24.25- 26.50	24.25- 26.50	26.25- 28.75	25.50- 27.75	39.00- 42.75	32.75- 35.75	19.50- 21.50	20.00- 21.75	20.00- 21.75
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	44.00	26.00	26.50	26.50
Sheets.....	37.50- 40.75	37.50- 40.75	39.50- 43.00	39.50- 43.00	53.00- 57.25	50.00- 54.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50- 30.75	33.00- 33.50	36.50- 39.50	35.00- 35.75	55.00- 57.25	48.50- 50.00	27.00	33.50	27.50

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill					Base
W	Cr	V	Mo	Co	per lb
13	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium.....					52¢
Oil hardened manganese.....					29¢
Special carbon.....					26.5¢
Extra carbon.....					22¢
Regular carbon.....					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi 4½¢ higher.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature.....	5.45
Electrical.....	5.95
Motor.....	6.70
Dynamo.....	7.50
Transformer 72.....	8.05 to 10.05
Transformer 65.....	8.60 to 10.60
Transformer 58.....	9.30 to 11.30
Transformer 52.....	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb.....	\$3.20†
Joint bars, 100 lb.....	4.25
Light rails (from billets) per 100 lb.....	3.55

Base Price
cents per lb

Track spikes.....	5.35
Axles.....	5.20
Screw spikes.....	8.00
Tie plates.....	4.05
Tie plates, Pittsburgh, Calif.*.....	4.20
Track bolts, untreated.....	8.25
Track bolts, heat treated, to rail- roads.....	8.50

*Seattle, add 30¢.

†CF&I, \$3.30.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.00¢
0.41 to 0.60 carbon.....	5.50¢
0.61 to 0.80 carbon.....	6.10¢
0.81 to 1.05 carbon.....	8.05¢
1.06 to 1.35 carbon.....	10.35¢
Worcester, add 0.30¢.	

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Coatesville, Pa.....	*26.50	
Washington, Pa.....	*26.50	*22.50
Claymont, Del.....	*26.50	
Conshohocken, Pa. ..		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.....	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville.	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville.	29.00	
Aluminized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.....		9.25

*Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails* 103	123
Galvanized nails*.....	103
Woven wire fence†.....	109
Fence posts, carloads††.....	114
Single loop bale ties.....	106
Galvanized barbed wire** 123	143
Twisted barbless wire... 123	...

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier.
** On 80 rod spools, in carloads. †† Duluth only.

Base per Pittsburg,
100 lb Calif.

Annealed fence wire†.....	\$4.80
Annealed, galv. fencing†.....	\$5.75
Cut nails, carloads††.....	6.20
	6.75

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn- alloy	HI Steel	Mayar R	Otis- coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie- Illinois, Republic	Republic	Alan Wood	Inland	Bethle- hem	Jones & Laughlin	Youngs- town Sheet & Tube	Great Lakes Steel
Plates.....	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.85
Sheets									
Hot-rolled.....	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.25
Cold-rolled.....	6.05	6.05	6.05	.....	6.05	6.05	6.05	6.05	6.35
Galvanized.....	.....	6.75	.....	.....	.....	6.75	.....	.....	.....
Strip									
Hot-rolled.....	4.95	4.95	4.95	.....	4.95	4.95	4.95	4.95	5.25
Cold-rolled.....	.....	.....	6.05	.....	.....	6.05	6.05	6.05	6.35
Shapes.....	.....	4.95	.....	.....	4.95	5.05	4.95	4.95	.....
Beams.....	.....	4.95	.....	.....	.....	.....	.....	.....	.....
Bars									
Hot-rolled.....	5.10	5.10	5.10	.....	5.10	5.10	5.10	5.10	5.40
Bar shapes.....	.....	5.10	.....	.....	5.10	5.10	5.10	5.10	.....

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, \$200.00 per net ton.

STANDARD, THREADED AND COUPLED

Steel, butt weld	Black	Galv.
1/2-in.	43 to 41	22 1/2 to 20 1/2
3/4-in.	46 to 44	26 1/2 to 24 1/2
1-in.	48 1/2 to 46 1/2	29 1/2 to 27 1/2
1 1/4-in.	49 to 47	30 to 28
1 1/2-in.	49 1/2 to 47 1/2	30 1/2 to 28 1/2
2-in.	50 to 48	31 to 29
2 1/2 to 3-in.	50 1/2 to 48 1/2	31 1/2 to 29 1/2

Steel, lap weld		
2-in.	39 1/2	22 to 20
2 1/2 to 3-in.	43 1/2 to 42 1/2	24 to 23
3 1/2 to 6-in.	46 1/2 to 42 1/2	27 to 23

Steel, seamless		
2-in.	38 1/2 to 27	19 to 7 1/2
2 1/2 to 3-in.	41 1/2 to 32 1/2	22 to 13
3 1/2 to 6-in.	43 1/2 to 38 1/2	24 to 19

Wrought Iron, butt weld		
1/2-in.	+20 1/2	+50
3/4-in.	+10 1/2	+39
1 & 1 1/4-in.	+4 1/2	+30
2-in.	-1 1/2	+26 1/2
3-in.	-2	+26

Wrought Iron, lap weld		
2-in.	+7 1/2	+34
2 1/2 to 3 1/2-in.	+5	+29 1/2
4-in.	list	+23 1/2
4 1/2 to 8-in.	+2	+25

EXTRA STRONG, PLAIN ENDS

Steel, butt weld		
1/2-in.	42 to 40	23 to 21
3/4-in.	46 to 44	27 to 25
1-in.	48 to 46	30 to 28
1 1/4-in.	48 1/2 to 46 1/2	30 1/2 to 28 1/2
1 1/2-in.	49 to 47	31 to 29
2-in.	49 1/2 to 47 1/2	31 1/2 to 30 1/2
2 1/2 to 3-in.	50 to 48	32 to 30

Steel, lap weld		
2-in.	39 1/2 to 38 1/2	21 to 20
2 1/2 to 3-in.	44 1/2 to 42 1/2	26 to 24
3 1/2 to 6-in.	48 to 44	29 1/2 to 27 1/2

Steel, seamless		
2-in.	37 1/2 to 32 1/2	19 to 14
2 1/2 to 3-in.	41 1/2 to 36 1/2	23 to 19
3 1/2 to 6-in.	45	26 1/2

Wrought Iron, butt weld		
1/2-in.	+16	+44
3/4-in.	+9 1/2	+37
1 to 2-in.	-1 1/2	+26

Wrought Iron, lap weld		
2-in.	+4 1/2	+30 1/2
2 1/2 to 4-in.	+19	+19
4 1/2 to 6-in.	-1	+23 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD Gage	Seamless	Electric Weld
in in. BWG	H.R.	C.D.
2 13	19.18	22.56
2 1/2 12	25.79	30.33
3 12	28.68	33.76
3 1/2 11	35.85	42.20
4 10	44.51	52.35

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$106.70
6 to 24-in., del'd N. Y.	103.50 to 108.40
6 to 24-in., Birmingham	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Flow bolts	47

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	41
1/2 in. and smaller	38	38
1/2 in. through 1 in.	39	39
9/16 in. through 1 in.	37	37
1 1/2 in. through 1 1/2 in.	35	37
1 1/2 in. and larger	28	28
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(1/2 in. and larger) Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller) Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws (In packages)

	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
1/2 to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per net ton
Effective CaF ₂ Content:	
70% or more	\$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to \$1.75
Aluminum	31.00¢
Antimony	51.17¢
Brass, 10 ton lots	27.25 to \$7.35¢
Copper, electrolytic	32.625¢
Copper, reduced	34.35¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	23.00¢
Manganese	60.00¢
Molybdenum, 99%	\$3.65
Nickel, unannealed	67.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.15¢
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	16.00 to 19.75¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.00 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$17.00
Foundry, Byproduct	
Buffalo, del'd	\$22.95
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	23.35
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	21.05
Swedeland, Pa., f.o.b.	21.00
Painesville, Ohio, f.o.b.	20.30
Erie, del'd	\$21.50 to 23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
First quality, Pa., Md., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00

	Per Net Ton
Chrome Brick	
Standard chemically bonded, Balt., Chester	\$69.00
Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

	Std. 3/4-in. grains
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and New Orleans (*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4615-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore.....	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.16	....	10.10	....	....
Birmingham.....	5.05	....	6.45	5.05	6.68	5.25	5.00	5.00	6.68	....	....	....	....
Boston.....	5.55	6.45-6.75	7.71-7.85	5.65-5.95	6.75	5.80	5.42	5.52	6.27	9.64-9.82	10.04-10.07	11.23-11.27	11.47-11.52
Buffalo.....	.85	5.00-5.75	7.26-7.70	5.29-5.65	6.35-7.27	5.35	5.10	5.05-5.15	5.90	9.70-9.73	9.95-9.98	11.15-11.18	11.40-11.43
Chicago.....	4.85	5.75	7.10	4.85	6.68	5.10	.90	6.15	5.70	9.73-9.85	9.98-10.00	11.18-10.80	11.43-11.05
Cincinnati.....	5.16-5.28*	6.13*-6.18	7.53	5.28*-5.55	....	5.53*-5.63	5.40*-5.48	5.33*-5.55	6.09*-6.10	9.74	9.99	11.19	11.44
Cleveland.....	4.98-5.16	5.75-6.06	7.20-7.46	5.03-5.15	....	5.37-5.54	5.16-5.47	5.90-5.97	9.49-9.86	9.74-9.81	10.95-11.07	11.19-11.32	11.43-11.52
Detroit.....	5.28-5.32	6.07-6.18	7.53-7.58	5.28-5.47	6.27-6.58	5.35-5.57	5.40	5.33-5.55	6.01-6.10	9.89-9.94	11.11-11.14	11.35-11.39	11.43-11.70
Houston.....	6.50-6.70	....	8.50	7.00	....	6.70	6.55	6.65	7.60	10.30	10.25	11.45	11.70
Indianapolis.....	5.15	6.05	7.39	5.15	6.25	5.40	5.20	5.35	6.50	....	....	....	....
Los Angeles.....	6.45-6.60	7.90-8.05	8.75-8.90	6.65-6.80	9.35*	6.15	5.95-6.10	6.10-6.25	7.95*14-9.35	10.90-11.60	10.85-11.55	12.40-12.95	12.65-13.20
Memphis.....	5.75	6.60	....	5.95	6.80	5.95	5.75	5.76	6.50	....	....	....	....
Milwaukee.....	5.03	5.93	7.28	5.38	6.86	5.28	5.08	5.08	5.87-5.89	9.53	9.78	10.98	11.23
New Orleans.....	5.95*	6.75*	....	6.15*	....	6.15*	5.95*	5.95*	6.65*	....	....	....	....
New York.....	5.40-5.51	6.46	7.71-7.86	5.62-5.98	....	5.70-6.00	5.33-5.61	5.67-5.80	6.41-6.61	9.73-9.93	9.98-10.18	11.18-11.38	11.43-11.63
Norfolk.....	5.80	....	....	6.05	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha.....	5.98	....	9.89	5.98	....	6.23	6.03	6.03	6.83	....	....	....	....
Philadelphia.....	5.32	6.49	7.48-7.58	5.60	6.69	5.53	5.25	5.55	6.34	9.64-9.69	9.89	10.94	11.19
Pittsburgh.....	4.85	5.75 ¹	7.15	5.00	6.00	5.05	4.90	4.90	5.65	9.35	9.60	10.80	11.05-11.30
Portland.....	6.50*-6.60	8.00 ¹	8.80-9.20	6.85*	....	6.30*	6.35*	6.35*	8.25 ¹⁴	10.50*	10.10*	....	....
Salt Lake City.....	7.05-8.00	8.20	7.90-9.08	7.10-7.70	....	5.75-6.85	6.65-7.00	6.95-7.25	7.40-7.55	....	....	....	....
San Francisco.....	6.15*	7.50 ²	8.10*	6.75*	8.25*	6.35*	6.90*	6.90*	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
Seattle.....	6.20*-7.10 ⁴	7.75*-8.65 ²	7.65-9.15 ³	6.55*-6.70 ⁴	....	6.20-6.35 ⁴	6.15-6.30 ⁴	6.05*-6.20 ⁴	8.00 ¹⁴ -8.15 ¹⁴	....	10.30 ¹⁵ -11.35 ¹⁵	....	12.00 ¹⁵ -14.10 ¹⁵
St. Louis.....	5.21-5.37	6.12-6.27	7.47-7.52	5.22-5.97	8.68	5.47-5.62	5.27-5.42	5.27-5.92	6.07-6.22	9.72	9.97	....	11.42
St. Paul.....	5.44	6.19-6.34	7.74	5.44	6.82	5.64-6.69	5.49	5.49	6.29	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1999 lb; strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	....	....	....	....
Birmingham.....	42.88	43.38	....	....	....
Buffalo.....	47.00	47.00	47.50	....	....
Chicago.....	46.00	46.50	46.50	47.00	....
Cleveland.....	46.00	46.50	46.50	47.00	51.00
Duluth.....	46.00	46.50	46.50	47.00	....
Erie.....	46.00	46.50	46.50	47.00	....
Everett.....	47.80	52.50	53.00	....	....
Granite City.....	47.80	48.40	48.90	....	....
Ironton, Utah.....	46.00-47.00	46.50-47.50	....	....	....
Lone Star, Texas.....	46.00	46.50	....	....	....
Neville Island.....	46.00	46.50	46.50	....	....
Geneva, Utah.....	46.00	46.50	....	....	....
Sharpsville.....	46.00	46.50	46.50	47.00	....
Steeltown.....	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio.....	46.00	....	....	....	....
Swedeland.....	48.00	48.50	49.00	49.50	....
Teleds.....	46.00	46.50	46.50	47.00	....
Troy, N. Y.....	....	....	....	....	54.00
Youngstown.....	46.00	46.50	46.50	....	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston.....	Everett.....	\$0.50 Arb.	....	53.00	53.50	....	....
Boston.....	Steeltown.....	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn.....	Bethlehem.....	3.90	51.90	....	....	....	....
Cincinnati.....	Birmingham.....	6.09	48.97	49.46	....	....	....
Jersey City.....	Bethlehem.....	2.39	50.39	....	....	....	....
Los Angeles.....	Geneva-Ironton.....	6.93	52.93-53.93	53.43-54.43	....	....	....
Mansfield.....	Cleveland-Toledo.....	3.03	49.03	49.53	49.53	60.03	54.03
Philadelphia.....	Bethlehem.....	2.21	50.21	....	....	....	....
Philadelphia.....	Swedeland.....	1.31	49.31	49.81	60.31	50.81	....
Philadelphia.....	Steeltown.....	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco.....	Geneva-Ironton.....	6.93	52.93-53.93	53.43-54.43	....	....	....
Seattle.....	Geneva-Ironton.....	6.93	52.93-53.93	53.43-54.43	....	....	....
St. Louis.....	Granite City.....	0.75 Arb.	48.65	49.15	49.65	....	....
Gulf Ports.....	Lone Star, Texas.....	....	50.50	51.00†	....	....	....

† Low Phos, Southern Grade

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 35¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess

of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.25 per ton for each additional 0.50 pct Si up to 17 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn; penalty, \$2.00 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.			
	16-19% Mn	19-21% Mn	
	3% max. Si	3% max. Si	
Palmerton, Pa.	\$64.00	\$65.00	
Pgh. or Chicago	65.00	66.00	

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.			
	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C			
7.00% max. Cl	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	
Ton lots	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth \$84.00, foundry, \$85.00; \$78.50 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct. Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	18.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.			
	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60.65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	
	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	
	\$1.20
Ferrochromium, 50-60% contract basis, delivered, per pound contained Cr.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	
	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	
	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa., per pound contained Mo.	
	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	
	\$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	
	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads, per net ton	
	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	
	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	8.15¢
Ton lots	9.55¢
Sinanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢
Boron Agents	
Contract prices per pound of alloy, delivered.	
Ferrobore, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D.	
Ton lot	\$1.20
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borasil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	
	\$6.25